United States Department of Agriculture
Forest Service

Leviathan-Loope Rangeland Project Environmental Assessment

Carson Ranger District, Humboldt-Toiyabe National Forest

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Chapter 1. Introduction, Background and Purpose and Need

This Leviathan-Loope Rangeland Project environmental assessment (EA) describes a USDA - Forest Service proposal to continue to authorize grazing on the Leviathan and Campbell-Loope Sheep and Goat (S&G) Allotments. The proposal also includes closing three vacant cattle and horse (C&H) allotments: Mud Lake, Double Springs, and Barber. All five allotments are located on the Carson Ranger District, with a small portion of the Leviathan Allotment occurring on the Bridgeport Ranger District of the Humboldt-Toiyabe National Forest. The Forest Service has prepared this EA in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. Supporting documentation, including more detailed analyses of project area resources, may be found in the project record located at the Carson Ranger Station in Carson City, Nevada.

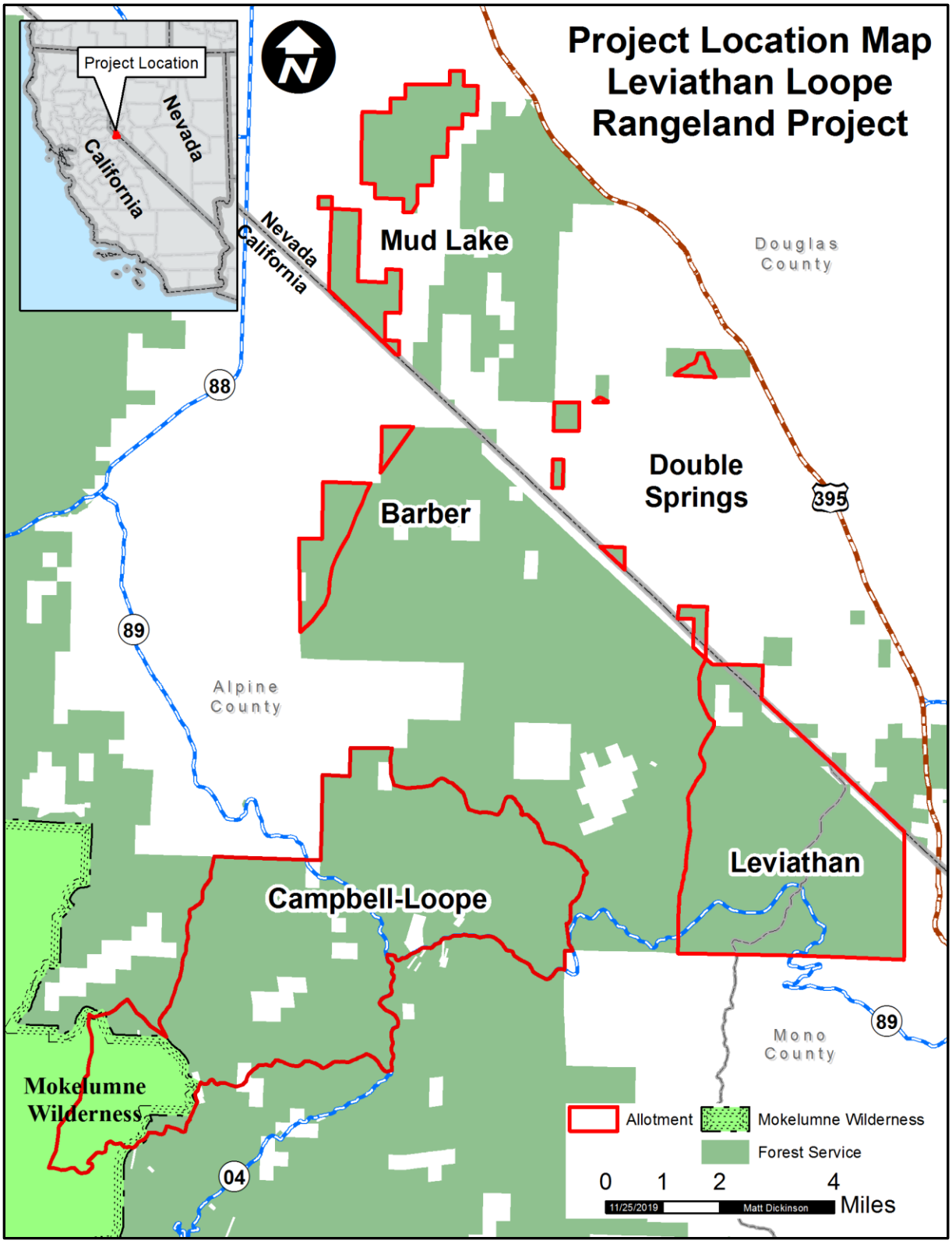
1.1 *Proposed Project Location*

The Campbell-Loope, Mud Lake, Double Springs, and Barber Allotments are located on the Carson Ranger District of the Humboldt-Toiyabe National Forest. The Leviathan Allotment is located on both the Carson and Bridgeport Ranger Districts of the Humboldt-Toiyabe National Forest. The Leviathan Allotment occurs in three counties: Alpine and Mono, CA and Douglas County NV; and the Campbell-Loope Allotment occurs entirely in Alpine County, CA. Mud Lake and Double Springs Allotments occur almost entirely in Douglas County, NV with a small portion (28 acres) of the Double Springs Allotment occurring in Alpine County, CA. A small portion of the Campbell-Loope Allotment occurs in the Mokelumne Wilderness (Figure 1).

1.2 *Background*

Borda Land and Sheep Company has held the Term Grazing Permit for Leviathan S&G since 2008. F.I.M., Corp. has held the Term Grazing Permit for Campbell- Loope S&G since the 1970’s. The Mud Lake, Double Springs, and Barber Allotments have been vacant since the early 1990’s. The history and background on each of the allotments is summarized for each allotment and can be found in the project record. Table 1 provides a summary of the current management strategy for all five allotments. The total project area, including all five allotments is approximately 31,180 acres, of which approximately 30,083 acres are National Forest System lands.

Figure 1. Vicinity map for the Leviathan-Loope Rangeland Project



Leviathan Allotment

The Leviathan Allotment consists of one grazing unit totaling approximately 8,975 acres, of which approximately 8,797 acres are National Forest System lands. Permitted use records through the Forest Service for the Leviathan allotment started in 1920. Based on grazing history in the surrounding areas, it is reasonable to assume the Leviathan Allotment was being grazed as early as the late 1870's, likely by sheep.

In 2000 the Forest Service determined the allotment was not suitable for cattle and would remain a sheep allotment. New forage utilization standards were incorporated into the Term Grazing Permit in 2004 following management direction in the SNFPA. The permit was waived to Borda Land & Sheep Co., the current permittee, in 2007. On average, the current use is for 4-6 weeks with one band of 650 to 810 ewes/lambs (Table 5).

Monitoring data collected in the 2000's indicates that most meadow systems, upland vegetation communities, and aspen stands are functioning-at-risk. Mountain brush, mahogany, and conifer stands are functioning, and noxious weeds are minimal (see the Vegetation and Range Specialist Reports in the project record). In August 2017 the lightning –caused Slinkard wildfire burned approximately 2,860 acres within the Leviathan Allotment. The fire consumed a large portion of the east side of the allotment, which is located on the Bridgeport Ranger District. As a result of the fire and per Forest Plan direction, total rest from livestock grazing occurred for two growing seasons and will continue until post-fire recovery determines grazing can resume.

Campbell-Loope Allotment

The Campbell-Loope Allotment was historically divided into three grazing units: Mogul, Indian, and Lexington Units: Indian Unit was the acreage west of the Carson River along Poorboy road. Currently, the allotment is managed as a single unit; totaling approximately 17,846 acres, of which 16,927 acres are National Forest System lands. The remaining acres are comprised of private and BLM lands, and will not be managed under the permit. Permitted use records through the Forest Service for the Campbell- Loope Allotment started in 1914; however, they were separate allotments. Based on grazing history in the surrounding areas, it is reasonable to assume the Campbell-Loope Allotment area was being grazed as early as the late 1870's, likely by sheep.

The current Campbell-Loope Allotment boundary took shape in 1974 when the allotments were merged and a temporary 5-year permit was issued to F.M. Fulstone, INC., and FM Fulstone Jr. to graze 1,600 dry ewes between August 16 and October 10 for 3,025 head months (Table 5). The Term Grazing Permit was amended in 2004 to incorporate the standards and guidelines from the Sierra Nevada Forest Plan Amendment. On average, the current use is for 1,100 dry ewes for 3 weeks with the majority of grazing activity occurring on the portion of the allotment east of the east fork Carson River (Mogul and Lexington Units).

Monitoring data collected in the 2000's indicates that most meadow systems, upland vegetation communities, mountain brush communities, and aspen stands are functioning-at-risk. Mahogany and conifer stands are functioning, and noxious weeds are minimal. In June 2015 the lightning –caused Washington wildfire burned approximately 6,570 acres within the Campbell-Loope Allotment. The fire consumed a large portion of the east side of the allotment, which has historically been the most utilized and capable portion of the allotment. There was 100% conifer consumption from highway 89, north up the Loope Canyon road.

As a result of the fire and per Forest Plan direction, total rest from livestock grazing occurred for two growing seasons until post-fire recovery determined grazing could resume in 2017 with avoidance areas in aspen stands.

Mud Lake Allotment

The Mud Lake allotment is split into two units, with private land in between them (figure 1). The 2,793-acre allotment has been vacant since the grazing permit was waived back to the Forest Service in 1993. The allotment provides little forage capability and access is limited due to the surrounding private lands. There are approximately

20 acres of wetland habitat that is heavily infested with noxious weeds and surrounded by private land. The Forest Service has been actively treating noxious weeds in this area to reduce the size of the infestations and restore important wetland habitat for wildlife. Treatments have included wetland approved herbicides, and biological control agents such as flies, weevils, and goats.

Double Springs Allotment

Double Springs is made up of several small, disconnected units that are surrounded by private and other agency lands (figure 1). The parcels are small (514 total acres), provide little forage value, and do not make up a feasible grazing unit. The Forest Service acquired the allotment from BLM through the National Forest and Public Lands Act of 1988. There are no records on file at the Carson Ranger District to indicate a grazing permit was ever issued for this allotment by the Forest Service; however, unauthorized livestock use has occurred in the past when cattle were permitted on the adjacent Cottonwood Allotment.

Barber Allotment

The Barber Allotment has been vacant since the 1990's. This allotment occurs as an isolated unit not connected to any other Forest Service allotments (figure 1). A Decision Notice signed in 1980 determined the allotment would be closed for wildlife management values once the permittee was no longer interested in owning the permit. The grazing permit was waived back to the Forest Service in 1996; however, the allotment was never closed. Due to the length of time since the 1980 Decision, closure of the Barber Allotment is re-evaluated in this proposed action.

Table 1. Current allotment management for the Leviathan-Loope Rangeland Project area

Allotment	Acres		Total Acres	Permitted Numbers	Permitted Season of Use	Allotment Status	Current Grazing Strategy
	Forest Service	Non-Forest Service					
Leviathan S&G	8,797	178	8,975	1,460 ewes/lambs	June 21st - September 20th	Active	Deferred rotation
Campbell-Loope S&G	16,927	919	17,846	1,650 dry ewes	August 16th - October 10th	Active	Deferred
Mud Lake C&H	2,793	N/A	2,793	N/A	N/A	Vacant	N/A
Double Springs C&H	514	N/A	514	N/A	N/A	Vacant	N/A
Barber C&H	1,052	N/A	1,052	N/A	N/A	Vacant	N/A

Summary of Allotments

Although portions of the allotments are still functioning outside the natural range of variability, recent monitoring indicates that most of these plant communities are on a stable to upward trend toward reestablished resiliency and ecological integrity. Proper grazing management can stimulate plant growth, improve nutrient cycling, and manipulate plant composition to improve conditions even further. Sheep grazing requires the use of a herder and several herding dogs that keep the herd moving throughout the allotment. This type of rotational grazing minimizes concentrated use in any one area and allows plants to be grazed at a sustainable level. The sheep herder can also redirect the grazing to focus on uplands rather than wetter areas such as meadows and riparian zones.

Some evidence of overgrazing is still present on both allotments. However, the history of overgrazing on these allotments occurred many decades ago when stocking rates and utilization were at levels that were leading to degraded resource conditions. More recently and particularly in the past two decades, range management of these allotments incorporates strict enforcement of grazing requirements including the reduced utilization levels implemented under the Sierra Nevada Forest Plan (2001) (tables 6-8). The Proposed Action would include a

management strategy that employs proper use criteria (utilization standards, disturbance thresholds etc.) that continues to include the Sierra Nevada Forest Plan as well as standards from the Bi-State Sage Grouse Forest Plan Amendment to assure that a stable or upward trend toward ecological function continues.

1.3 *Need for the Proposal*

Recent ecological monitoring shows that portions of the Leviathan and Campbell-Loope Allotments are functioning outside the natural range of variability as compared to historic known values. There is a need to manage the allotments in a manner that meets or moves toward the desired future resource conditions as defined in the Forest Plan and the site-specific desired conditions. Proper grazing management can stimulate plant growth, improve nutrient cycling, and manipulate plant composition to improve conditions and help reestablish resiliency and ecological integrity to the site.

Actions such as modified management strategies, changed seasons of use, and modified or new water developments need to be considered to meet desired future conditions. This need for action is driven by a gap between desired rangeland conditions and existing conditions and the interest in the continued use of these allotments as permitted rangeland. When existing conditions are less than desired and there are no indications that conditions are improving under the existing management actions, changes in management are needed to improve rangeland conditions. There is also a need to evaluate the closure of three small, vacant allotments. The Mud Lake, Double Springs and Barber Allotments are not currently able to function as part of a sustainable grazing system due to their isolated location and lack of connectivity to other grazable lands.

This action is being considered at this time because current and prospective permittees have expressed a desire to graze or continue grazing on allotments in the project area, and the Rescissions Act of 1995 directs the Forest Service to establish and adhere to a schedule to complete environmental analyses and decisions on all allotments. National Forest System lands provide an important source of livestock forage.

Congress has made it clear through the Multiple-Use Sustained-Yield Act and the National Forest Management Act that domestic livestock grazing is one of many activities that should be considered when balancing the multiple uses on National Forest System lands. One of the desired conditions stated in the Toiyabe Forest Plan (USDA FS 1986) provides guidance on the appropriate balance between livestock grazing with other uses.

1.4 *Management Direction*

Projects that take place on National Forest System lands are guided by the management direction (i.e., desired conditions, goals, objectives, and standards and guidelines) set out in the forest plan specific to each National Forest. The 1986 *Land and Resource Management Plan* (LRMP) for the Toiyabe National Forest, as amended by both the 2004 *Sierra Nevada Forest Plan Amendment* (SNFPA) and the 2016 *Greater Sage-grouse Bi-State Distinct Population Segment Forest Plan Amendment* (Bi-State Amendment), provides this management direction and embodies the provisions of NFMA, its implementing regulations, and other guiding documents. Appendix D provides detailed information on Forest Plan Direction.

Rangeland health assessments vary, but all use some combination of qualitative and quantitative methods to assess the direction of change for the biotic, hydrologic, and soil attributes at monitoring sites. Several different but similar terms (late seral, mid-succession, functioning) are used to describe desired (or satisfactory) range conditions in the management direction. For this analysis, all of these slightly different terms for the desired condition are interpreted as meaning the area would be in a mid or later ecological status and in a stable or upward trend (table 2). The mid to late ecological status indicates a relationship to a potential natural community (i.e., a condition that would be achieved if there were no interference by humans) and a resilience to disturbance.

The analysis for this project will describe the desired condition in terms of whether the area is functioning. The term "functioning" indicates the same concepts as the desired conditions referenced in the Forest Plan and FSH 2209.21. "Functioning" means a vegetative community has the most appropriate soil and vegetative characteristics that enable it to efficiently process precipitation, reproduce healthy vegetation, and withstand or be resilient to disturbance. It incorporates how well these individual vegetative groups receive and process precipitation and can withstand extreme weather, fire, or human caused events or activities without resulting in degraded states.

The condition terms "late seral with a stable or upward trend," "mid-succession with a stable or upward trend," and "functioning" all fit within the meaning of "satisfactory condition" as expressed in the Forest Plan (USDA FS 1986, IV-26). Rangelands are considered to be in functioning-at-risk condition when short-term objectives are being met but functionality criteria are not yet present (FSH 2209.21). This is the case with rangelands that are in "early seral" ecological status, even when there is an upward trend.

The Forest Plan provides direction to develop scorecards to rate ecological status. This project uses the Eastern Sierra Nevada Riparian Field Guide (USDA FS 1999) and the Resource Implementation Protocol for Condition Assessment Matrices", herein referred to as the "Matrices" (USDA FS 2009). The Matrices provide parameters for soil, vegetation, hydrology, and disturbance factors that indicate whether a vegetation community, and the habitat it represents, are functioning, functioning-at-risk, or non-functioning condition. The Matrices are a tool for field personnel to use to determine the ecological condition of various community types (for example, mountain big sagebrush, wet meadows, aspen, and mountain mahogany). A community type would be correlated to a plant alliance (i.e., mountain big sagebrush) at the field data collection level. The Matrices are based on field research, literature reviews, and Natural Resources Conservation Service (NRCS) ecological site

Table 2. Criteria and process included in the Matrices was scientifically peer reviewed (USDA FS 2009). Crosswalk of terms and their relationship with each other used in the Toiyabe Forest Plan, the SNFPA, the Ecological Scorecards, and the Matrices.

Toiyabe Forest Plan Ecological Condition	Rangeland Condition[1]	Eastern Sierra Nevada Riparian Field Guide (Scorecards)$_2$	Matrices	Sierra Nevada Forest Plan
Satisfactory	Late seral with stable or upward trend	High	Functioning (F)	Late Seral
	Mid-succession with stable or upward trend	Moderate		
Unsatisfactory	Late seral with downward trend	Low	Functioning-at-Risk (FR) to Non-functioning (NF)	Early Seral
	Mid-succession with downward trend	Very Low		
	Early seral			

[1]Terms used in Forest Plan and defined in the Region 4 Range Analysis Handbook (USDA FS 1981) [2]Proper Functioning Condition is considered equivalent to High or Moderate rating under the scorecards and is the term used in the BSSG Forest Plan Amendment for riparian areas.

The overall ecological condition of various vegetative communities within each allotment has been established using the best available information (see table 7). Review of all available data sources, site visits, and

professional expertise and knowledge was used to determine the condition of each allotment based on the attributes listed in the ecological scorecards and Matrices using the current terminology in the FSH 2209.21.

1.5 *Rangeland Capability and Suitability*

As part of the process of evaluating the purpose and need for this project, the capability and suitability of the Leviathan and Campbell-Loope Allotments for sheep grazing was reviewed by the interdisciplinary team. As a starting point, the team reviewed the capability and suitability analysis that was compiled for the Forest Plan for all rangelands on the Toiyabe National Forest (USDA FS 2008). The Forest Plan analysis includes information from the Forest Plan, the final environmental impact statement (FEIS) for the Forest Plan, and the Analysis of the Management Situation (USDA FS 1981). Rangeland capability was then modeled spatially using current information and definitions. The Forest Plan modeling reflects that all the allotments in the project area have some rangelands capable of producing forage for domestic grazing.

In addition to the Forest plan review, specific analysis was conducted on the capability and suitability of both allotments proposed for continued livestock grazing. Capability is the potential of an area of land to produce resources and supply goods and services (FSM 1905; 36 CFR: 219.3). In the case of livestock grazing 'goods and service' essentially equates to the availability of the forage and the ability of the landscape to support long-term grazing by livestock. As displayed in Table 3, some of the rangelands in the project area do not meet the capability definition. This does not mean that those rangelands cannot be crossed by livestock or that some forage cannot be removed by livestock without causing an unacceptable impact. For example, in areas with enough tree canopy to reduce forage production to less than 200 pounds per acre, it does not mean livestock could not or should not pass through or remove some forage while passing through the area. Rather, it means the area was not deemed to have enough forage production to be used as a base for determining grazing capacity. Lands that were not identified as capable can be grazed and would be managed under the same standards as lands that were identified as capable.

Rangeland suitability was also considered for the Forest Plan and for this project. Suitability considers the compatibility of domestic livestock grazing with other resources and activities on NFS lands. At the Forest level, approximately 1.1 million of the 3.2 million acres in the Forest were found to be suitable for grazing (areas that do not include administrative sites, campgrounds, municipal watersheds, etc.) (USDA FS 2008). A project-level review for the Leviathan-Loope Project area determined there were no unsuitable acres for grazing within all allotments (Table 3).

Table 3. Comparison of capable acres for sheep and goat for the sheep allotments, and cattle and horse for the cattle allotments: existing allotment acres verses proposed acres for the Leviathan-Loope Rangeland Project area.

Allotment	Total NFS Acres	Capable Acres	Percent Capable	Proposed Action Total NFS Acres	Proposed Action Capable Acres	Proposed Action Percent Capable	Suitable Acres	Percent Suitable
Leviathan (sheep)	8,975	7,055	78.6	8,975	7,055	78.6	8,975	100.0
Campbell-Loope (sheep)	17,846	6,980	39.1	15,093	6,350	42.1	15,093	100.0
Mud Lake (cattle)	2,793	904	32.4	2,793	904	32.4	2,793	100.0
Double Springs (cattle)	514	139	27.0	514	139	27.0	514	100.0
Barber (cattle)	1,052	309	29.4	1,052	309	29.4	1,052	100.0

1.6 ***Public Involvement***

Notice of this project was published in the Schedule of Proposed Actions (SOPA) on August 19, 2014. A Notice of Proposed Action (NOPA) was distributed on February 20, 2015 to approximately 36 agencies, individuals, and organizations. The NOPA summarized the Proposed Action, provided notification that an EA was being prepared and would be available for review, and requested comments on the proposed action. A legal notice advising of the availability of the NOPA was published in Reno, Nevada, in the Reno Gazette Journal, the newspaper of record on February 26, 2015.

The 30-day comment period on the proposed action ended on March 27, 2015. The Forest received comments from five organizations/individuals during the comment period and comments from one organization outside of the comment period. Scoping material has been posted at https://www.fs.usda.gov/project/?project=45038. A summary of the scoping comments and responses is located in Appendix A.

The Forest Service consulted individuals, Federal, State, tribal, and local agencies during the development of this EA. The list of entities contacted are listed in the Agencies and Persons Consulted section at the end of this EA.

Comment Consideration

The interdisciplinary team reviewed comments received during public and internal scoping in an effort to identify issues (unresolved resource conflicts) created by the Proposed Action. Comments were received from individuals, organizations and state agencies. Each comment received was considered a potential issue and evaluated to determine which of the following ways the comment would be resolved or addressed.

- Resolved by Forest Plan land use designations.
- Addressed through implementation of Forest Plan standards and guidelines and best management practices.
- Addressed through implementation of resource-specific design features.
- Addressed during processes or analysis routinely conducted by the interdisciplinary team.
- Addressed through spatial location of activities during design of project alternatives.
- Used to drive or partially drive an alternative.
- Beyond the scope of the project.

After reviewing all comments, the ID Team and the responsible official determined there were no unresolved resource conflicts and therefore no issues. As documented in the Effects Analysis section of this document and this project's planning record, the Proposed Action would not result in unacceptable impacts to any given resource and the Proposed Action would be consistent with applicable laws, rules, regulations, and Forest Plan standards and guidelines.

Although no issues were identified, several key concerns from commenters were brought forward during the review of comments. These key concerns were discussed in detail in Appendix A: Consideration of Comments, as well as in various sections of the EA and associated specialist reports (Wildlife, Range, and Vegetation) as referenced below:

- ***Allotment boundary adjustments within the wilderness are detrimental to future grazing in the area*** (Appendix A: Comment #38; pp. 10-11; EA p. 30)
- ***The Proposed Monitoring procedure is not consistent with the more recent approaches used by other agencies such as NRCS*** (Appendix A: Comments #17,18; Range Specialist Report pp. 24-34; and the Vegetation Specialist Report pp. 1-7)
- ***Allotment closures are detrimental to the future of grazing in the area*** (Appendix A: Comment #35)

- ***Sage grouse may be negatively affected from changes to season of use and improvements to water developments*** (Wildlife Biological Evaluation; EA pp 53-56; Appendix A: Comment#39-42)
- ***How climate change was considered in the project planning***:
  Climate change is an agency-wide priority for the USFS, which has issued direction to administrative units for responding to climate change (USDA FS 2008). The goal of the USFS climate change strategy is to "ensure our national forests and private working lands are conserved, restored, and made more resilient to climate change." (USDA FS 2010, p. 2). Although climate variability makes predictions about drought, rainfall, and temperature extremes highly uncertain, climate change is an acknowledged pressure on forest and rangeland ecosystems (USDA FS 2007). In California temperatures have been increasing annually with the past four years being the hottest on record. Drought has become more frequent and extreme and the Sierra Nevada snowmelt has declined leaving less water available for the state (CAEPA 2020). Statewide warming is expected to increase by 2-4 ℃ to 4-7 ℃ by the end of the century (Pierce et al. 2018). Daily extreme precipitation values are projected to increase 5-15% to 15-20% meaning the potential for more intense flooding as well as more extreme drought conditions (Ibid).

  Although there is a strong consensus that global climate change is occurring, there is still much uncertainty about subsequent ecological interactions and trends at the local or site-specific scale. Where appropriate, climate change research is used in this document to address the potential confounding effects of livestock grazing and climate change on resources. In response to the effects of climate change, adaptation strategies for livestock grazing focus on increasing resilience of rangeland vegetation. The Proposed Action incorporates an adaptive management approach which includes modifying grazing strategies based on annual and long-term monitoring data. While these data are not necessarily assessing if ecological trends are due to climate change, they provide indicators of changing environments and are drivers for change in grazing management. In addition to monitoring data, the Forest Service relies on resources such as the National Weather Service drought models (https://www.cpc.ncep.noaa.gov/products/Drought) which allows range managers annually to prepare permittees for possible modifications to the upcoming grazing season based on predicted conditions. These modifications include flexibility in timing, duration, and intensity of authorized grazing. In cases of severe drought, individual units or entire allotments may need to be rested. All of these methods are incorporated into the proposed action and are designed to prevent ecosystem degradation under changing conditions, as well as establish a more collaborative approach to grazing management (USDA FS 2018).

1.7 *Tribal Involvement*

The special and unique legal and political relationships of tribal governments and the United States government are reflected in the United States Constitution, treaties, statutes, court decisions, executive orders, and memoranda. These relationships impart a duty on all federal actions to consult, coordinate, and communicate with American Indian Tribes on a government-to-government basis. Because American Indian Tribes can be affected by Forest Service policies and actions managing the lands and resources under its jurisdiction, the Forest Service has a duty to consult with American Indian Tribes on matters affecting their interests.

Because of this government-to-government relationship, efforts were made to involve local tribal governments and to solicit their input regarding the proposed action. Formal consultation was initiated with the Washoe Tribe of California and Nevada at a semi-annual meeting in 2013. As a result of the meeting, concern for an important cultural site was expressed and a site visit requested. Former District Archaeologist, Joe Garrotto, and the Tribal Historic Preservation Officer (THPO) for the Washoe Tribe visited the location in summer 2013. As part of this undertaking, the site was fully recorded with the help of the Washoe THPO and other volunteers. In addition to being formally recorded, sheep will not be allowed to graze within the site boundaries. The project was also discussed in subsequent formal consultation meetings in March 2015 and March 2016. The Tribe expressed no other concerns regarding this project.

1.8 *Decision Framework*

This is how grazing is authorized on Forest Service lands:

1) After NEPA analysis, a decision approves grazing for an area, allotment, or groups of allotments.

2) Allotment management plans contain pertinent livestock management direction from project decision.

3) Grazing permits authorize a specific holder (permittee) to graze livestock according to project decision.

4) Annual operating instructions prescribe annual actions for the permittee.

The District Ranger is the Responsible Official (RO) who will decide whether to continue to authorize livestock grazing on these allotments and, if so, under what terms and conditions to meet or move toward meeting the Forest Plan objectives in a timely manner. This decision will be based on the environmental analysis, including any necessary mitigation and monitoring requirements necessary to be consistent with the Forest Plan and to comply with applicable laws, regulations, and policies.

This EA is not a decision document. This EA discloses the environmental consequences of implementing the proposed action and alternatives to that action. The Forest Service decision will be stated and explained in a Decision Notice (DN). The DN will disclose the rationale for choosing the selected alternative; discuss the rationale for rejecting other alternatives; and disclose how the decision responds to the relevant issues.

Once a decision is made, a Term Grazing Permit, Allotment Management Plan (AMP), and Annual Operating Instructions (AOI) may be issued provided that they are in compliance with the NEPA-based decision. These documents are implementation documents and do not constitute decision points. These items are discussed separately in the graphic on the left.

Chapter 2: Proposed Action and Alternatives

2.1. *Introduction*

This chapter describes the proposed action and no action alternatives and summarizes the environmental impacts of the alternatives, including associated design criteria, and grazing and monitoring strategies.

2.2. *Development of Alternatives*

NEPA regulations require that agencies should "vigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. The alternatives should achieve the same or similar purpose as the proposed action and should address issues raised and include appropriate mitigation measures not already included in the proposed action. Alternatives that would not be reasonable, either because they do not meet the purpose and need or because of other considerations, may be eliminated from detailed study.

2.3. *Alternatives Considered in Detail*

This section describes two alternatives considered in detail. The alternatives analyzed include the required "No Action" (Alternative 2), which analyzes a no grazing alternative, and the "Proposed Action" (Alternative 1).

2.3.1 Alternative 1: Proposed Action

Alternative 1, the Proposed Action, was developed to meet the purpose and need for the Leviathan-Loope Rangeland Project and is presented in the next sections of this Environmental Assessment. Since public scoping, minor changes or clarifications listed below have been made to the Proposed Action. These changes are incorporated into the Proposed Action described in Chapter 1 and are highlighted in the "Incremental changes to the Proposed Action since Comment Periods" section below for clarity.

The Proposed Action is based on the current ecological condition of the rangelands to set annual proper use criteria. The Proposed Action provides for future changes in these criteria as a result of a change in the ecological condition. To improve areas that are not in desired condition (functioning condition), the Proposed Action applies reduced utilization levels designed to assist improvement in those areas. The Proposed Action also provides for various grazing practices and strategies to be implemented to allow grazing activities to contribute to achieving the desired ecological condition and sets proper use criteria for habitat groups based on three possible ecological conditions (functioning, functioning-at-risk, and non-functioning).

In summary, the Proposed Action consists of the following actions:

- Continue to authorize sheep grazing for the Leviathan and Campbell-Loope Allotments.
- Modify existing grazing management strategies to help move rangelands to a more ecologically functioning condition. Modifications include extending the permitted season of use for both allotments to provide more flexibility with meeting range management goals.
- Include a management strategy that employs proper use criteria (utilization standards, disturbance thresholds, etc.) that promotes an upward trend toward satisfactory ecological function.
- Establish proper use criteria and within season triggers to determine when livestock should be moved or removed. The proper use criteria are based on the current ecological condition for each habitat group within each allotment.
- Develop and/or maintain existing springs and water developments to increase the distribution of livestock throughout the allotment and help improve rangeland condition.
- Apply design features to minimize the impacts or potential impacts of grazing and associated activities.
- Conduct short-term and long-term monitoring to determine if adjustments to proper-use criteria, and or to the timing, duration and intensity of grazing are necessary based on ecological assessments and management objectives.
- Develop updated Allotment Management Plans (AMPs) for Leviathan and Campbell-Loope Allotments.
- Modify the Campbell-Loope Allotment boundary to exclude areas that are largely inaccessible to livestock and contain non-contiguous patches of forage (2,753 acres).
- Close the Mud Lake, Double Springs, and Barber Allotments to livestock grazing (4,359 acres).

Incremental changes to the Proposed Action since Comment Period

As guided by 40 CFR 1502.21 (36 CFR 220.5(e)), the responsible official may modify the proposed action and alternative(s) under consideration prior to issuing the Environmental Assessment. The documentation of these incremental changes to a proposed action or alternatives shall be included or incorporated by reference in accord with 40 CFR 1502.21. The intent of the regulation is to encourage collaboration throughout the analysis and decision-making process. Ongoing collaboration may often result in modification of a proposed action or

alternative(s), resulting in a better proposal and ultimately a better decision. Such changes may not necessarily require the development of a new alternative if they can be accommodated through modification of an existing alternative. Incremental modifications that occur as a result of collaboration should be clearly described and documented in the analysis record, so that interested parties have a clear understanding of the nature of and reasons for the incremental changes.

Minor changes or clarifications made to the Proposed Action since the Comment Period are described below:

- ***Season of Use***- A change in the dates for the season of use for both allotments is proposed to allow for greater flexibility with range management needs (Table 4). Compared to the dates proposed in the Notice of Proposed Action (USDA 2015), the newly proposed dates will provide even greater flexibility in meeting management objectives by allowing livestock to graze earlier in the season when conditions are appropriate such as predicted drought years. The earlier on and off dates will allow for flexibility in meeting strategic management goals such as using sheep to control cheatgrass infestations. Grazing during spring when cheatgrass is palatable to sheep can help reduce infestations by limiting seed production. Similarly, new research is showing that livestock can also have an impact on cheatgrass when grazed in the fall months (Shcmelzer et al. 2014). Extending the ending dates will also provide flexibility when range conditions are not ready until much later in the season due to heavy and sustained snow years. The actual grazing season for each allotment would be determined annually based on range readiness conditions (i.e. weather, soil moisture, vegetation) and within-season utilization monitoring (Appendix E). The typical grazing season for both allotments will continue to average one to two months.

Table 4. Comparison table showing currently permitted season of use, season of use dates proposed in the 2015 Notice of Proposed Action and the new proposed season of use for the Leviathan and Campbell-Loope Allotments.

Allotment	Currently Permitted Season of Use	Proposed Season of Use in the 2015 Notice of Proposed Action	Newly Proposed Season of Use Dates
Leviathan	June 21st-September 20th	June 1st-October 31st	May 15th-Octber 31st
Campbell-Loope	August 16th-October 10th	June 1st –October 31st	May 15th-October 31st

- ***Occupancy***- In the Notice of Proposed Action, occupancy was described in terms of permitted numbers of sheep for each allotment. In order to align with current Region 4 Range Management practices and actual grazing permit language, the term 'head months' is incorporated into the EA and is used to better reflect how each allotment will be stocked. Head months is defined as the use and occupancy of the range by one animal for one month (FSM 2230.5). Managing allotments based on head months allows for the flexibility of grazing different classes of sheep (i.e. ewes only, ewes and lambs, etc.) while still achieving the same management objective. The Leviathan –Loope Rangeland Specialist Report provides more detailed information on head months and how they are calculated (Project record). Table 5 in the Occupancy/Season of Use section below displays the current number of head months compared to the average and maximum number of head months included in the scoped proposed action. It is important to note that under the proposed action there is no change to the current maximum permitted numbers of head months.
- ***Stocking Rate***-In the Notice of Proposed Action a lower limit and an upper limit of permitted numbers was generated to provide a range of occupancy for each allotment. The lower limit of the permitted numbers was proposed to initially stock the allotments in order to help move the rangelands into more functioning condition. The Proposed Action no longer contains an initial stocking rate. As described above, as well as in the Occupancy section of this EA, the proposed action now provides a maximum number of head months that would be permitted on each allotment. The maximum head months would not be exceeded but annual authorized use may be less than permitted. The primary focus of grazing management is the resource

outcome and to assure ecological conditions are functioning. This change to the Proposed Action increases management flexibility to make necessary changes to meet objectives. While using less numbers of livestock may be one option to achieve management objectives, adjusting the timing and duration of grazing are additional tools that also can be used. Determining which strategy is appropriate will be based on annual monitoring as well as other factors such as disturbances (i.e. fire) or predicted weather events (i.e. drought) (see Appendix E).

Details of the Proposed Action

Provide livestock grazing flexibility within the limits of permit terms and conditions

Occupancy/Grazing Capacity

A Forest Service grazing permit authorizes a maximum level of occupancy on NFS lands. Within the Forest Service, occupancy is identified in terms of head months, which is a metric that incorporates the foraging capacity of the rangelands, kind and class of livestock, season of use, and livestock numbers. Head months is defined as a month's use and occupancy of range by one animal. Head months, kind/class of livestock, and season of use are all identified on a Forest Service Term Grazing Permit. The focus of the Forest Service authorization is attainment of resource conditions, not permitted numbers. Management of livestock numbers has the least effect toward controlling the timing, frequency, and intensity of grazing use in achieving desired conditions. Occupancy is contingent upon compliance with the terms and conditions of the grazing permit, and adjustments that result in increases or decreases in livestock numbers are based on annual monitoring and can be done administratively.

Occupancy is generally determined by the carrying (foraging) capacity of rangelands within an allotment. In addition to managing grazing timing, intensity and duration on allotments, establishing a maximum number of head months for each allotment with the ability to administratively adjust authorized livestock numbers on an annual basis allows for greater flexibility in achieving short-term and long-term management objectives. For example, when resource needs are not being met by the prescribed utilization standards, utilization rates are decreased and/or grazing capacity (stocking rates) can be adjusted (see Appendix E). If livestock use is consistently within forage utilization levels and soils and vegetation conditions and trends are acceptable (i.e. generally stable or moving toward desired conditions for the allotment), then stocking is considered to be within capacity.

Forest Service direction for determining grazing capacity has evolved over time. Capacity is currently determined by analyzing effects of livestock grazing on the resources in the allotment and determining if Forest Plan standards are being met. Primarily, forage utilization monitoring is used to validate stocking rates and adjust when necessary. Utilization standards are developed to ensure plant vigor and productivity is maintained and/or improved. Forage utilization monitoring is the basis for making adjustments in management or stocking rates. If livestock use is consistently within forage utilization levels and soils and vegetation conditions and trends are acceptable (i.e., generally stable or moving toward desired conditions for the allotment), then stocking is considered to be within capacity. If livestock use results in having to consistently accelerate the scheduled rotations through pastures or requires them to be removed from an allotment early, it is considered to indicate that stocking is outside of capacity and a need for change in the grazing capacity is appropriate (see Appendix E). Use becomes self-regulating because management is based on meeting plant and other resource-desired conditions rather than on meeting any prescribed level of use.

To obtain a maximum stocking rate for the Leviathan-Loope Project area, an in-depth file search of the allotment records was completed to review stocking rates and other management actions that have occurred since the implementation of the 2001 Sierra Nevada Forest Plan Amendment (SNFPA). The SNFPA established new

utilization standards for riparian and meadow plant communities that were at lower levels than stated in the Toiyabe Forest Plan. Since 2001, all Carson Ranger District Allotments have been managed under these new standards. In addition to previous stocking rates, the forage capability of each allotment was also considered when determining appropriate numbers (See Rangeland Capability/Suitable section of this EA and Range Specialist Report).

Table 5 displays the maximum occupancy rate based on the capacity (foraging) of rangelands within each allotment. In addition to managing grazing intensity and duration on allotments, establishing maximum occupancy with parameters for each allotment will allow for greater flexibility in achieving short-term and long-term management objectives. As mentioned throughout this section, in the Range Specialist Report and other documents, stocking rates and season of use for both allotments will be re-evaluated annually and adjusted when necessary to meet the desired ecological conditions.

Season of Use

The analyzed seasons of use represents the earliest and latest allowable dates for livestock to be on the allotments. Under the Proposed Action, the season of use dates would be permitted from May 15 to October 31 with the typical grazing season lasting one to two months. However, the actual grazing season would be determined annually based on range readiness conditions (i.e. weather, soil, vegetation), drought predictions, within season utilization monitoring, and long-term and short-term monitoring

Proper season of use would be directed at matching the timing of livestock grazing with the kind of plant community on the allotment, taking into consideration the long-term objectives for the range. Adjusting the season of use on pastures would allow plant species to be grazed at different phenological stages instead of being grazed at the same time every year. As mentioned above in the Incremental Changes section, extending the season into spring and fall months can also help range management goals to be met, such as reducing cheatgrass populations by allowing grazing during spring green up or in the fall to remove dead grass, which can act as fuel for wildfires.

Grazing Management Strategies

Rest Rotation and deferred rotation grazing systems allow for the most efficient and non-impactive use of rangelands as pastures (or units) are rested for either a year or more at a time or deferred until the appropriate season for the plant community. For both allotments, utilization measurements would be based on within season triggers and end of the growing season conditions and streambank disturbance would be based on a percentage of natural streambank stability.

For both allotments, grazing strategies will be designed to incorporate one or more of the following guidelines:

1. No grazing in any one pasture or area twice in the same season
2. Vary the time of year livestock are in any one unit or area over several years
3. Provide periodic rest when needed
4. Limit the amount of time sheep spent in any area so as to minimize impacts
5. Provide adequate time for plant growth prior to grazing.

Table 5. Current permitted numbers and head month equivalencies and season of use dates for the Leviathan and Campbell-Loope Allotments compared to stocking rates and season of use under the proposed action. Actual use for the past ten years is also presented to illustrate how the allotments have been grazed in the recent past.

Allotment	Current Permitted Sheep # and season of use	Current permitted number of days grazed	Current permitted head months equivalent	Average actual use sheep numbers for 2011-2019	Average Actual Use for 2011-2019 in head months equivalent	Average Actual Number of Days Grazed for 2011-2019	Proposed maximum stocking and variable season of use	Proposed Maximum number of days grazed
Leviathan S&G	1,460 ewes/lambs 6/21-9/20	92 days	4,416 head months	656 ewes/lambs	685 head months	33 days	4,416 head months 5/15-10/31	92 days
Campbell-Loope S&G	1,650 Ewes 8/16-10/10	56 days	3,038 head months	1,245 Ewes (Includes 2 years of nonuse)	1,449 head months (Includes 2 years of nonuse)	28 days (Includes 2 years of nonuse)	3,038 head months 5/15-10/31	56 days

Forage Utilization and Proper Use Criteria

The 2001 and 2004 Record of Decision for the Sierra Nevada Forest Plan Amendment set utilization standards for riparian and meadow plant communities at lower levels than stated in the Toiyabe Forest Plan (table 6). Utilization levels for riparian on all allotments on the Carson Ranger District have followed the SNFPA standards since implementation of the plan in 2001. The Maximum utilization standards described in the Forest Plan as amended by the Sierra Nevada Forest Plan (SNFPA) and refined through ID Team collaboration are identified below (Table 6). The Greater Sage-grouse Bi-state Distinct Population Segment Forest Plan Amendment Record of Decision, signed June 2016, includes additional direction related to utilization standards for riparian and upland communities and will be incorporated into the management of the allotments.

The Intermountain Region Rangeland Ecosystem Analysis and Monitoring Handbook (FSH 2209.21, Ch. Zero Code) defines proper use criteria as the "…limiting factor or factors which will be measured on a particular site to determine if the site has been properly used. It could be residual forage, impact on other resources or uses, or any other measurable factor on a particular site."

Under the Proposed Action proper use criteria (which could include forage herbaceous and browse utilization, streambank disturbance, etc.) would be set for each allotment based on current rangeland ecological conditions. Proper use criteria are guides for managing livestock movement and for assessing forage use at the end of growing season. The assessment of proper use criteria determines if grazing maintains resources in an appropriate ecological condition for moving toward objectives. The proper use criteria are designed to manage livestock grazing at levels that would move the resources towards the desired conditions. The proper use criteria are not desired conditions, they are measurable limits on grazing that would allow the landscape features to meet or move towards desired conditions. Annual monitoring (short-term monitoring) alone cannot determine whether a proper grazing system is contributing to meeting ecological objectives. Long-term monitoring is necessary to determine the ecological condition and trend of the rangeland resources.

In general, the highest proper use rates for each habitat group are assigned to allotments that are in functioning condition (Tables 6 and 7). Proper use at these levels is expected to move these areas toward functioning condition. Proper use rates for habitat groups that are in functioning-at-risk or non-functioning condition are lower than the

functioning category. Proper use under these rates is expected to allow these habitat groups to move toward and become functioning.

Proper use criteria for the two active allotments were established based upon the most current information available regarding the conditions and trends of resources within each allotment. These proper use criteria are based on Forest Plan established standards as amended, as well as review of scientific literature on grazing and its effect on vegetation under conditions similar to those in the Leviathan-Loope Rangeland Project area. In general, the proper use criteria have been adjusted to more appropriately reflect levels of use that would protect resources and ensure stable and upward trends in vegetation and stream conditions. Proper use criteria would be re-evaluated annually and adjusted (if necessary) to the appropriate level to meet resource objectives (see Appendix E). As displayed in Table 6 and Table 7 (and in Appendix E), utilization levels and other proper use criteria are adjusted depending on the ecological condition of the range (non-functioning, functioning-at-risk, functioning). For example, if ecological conditions improve to satisfactory in upland shrubs, utilization rates may be increased. Likewise, if conditions deteriorate, utilization levels would be lowered. For both allotments, utilization measurements would be based on within-season triggers and end of the growing season conditions, and streambank disturbance would be based on a percentage of natural streambank stability. Table 8 provides a summary of the initial grazing strategy for Leviathan and Campbell-Loope Allotments and includes utilizations levels lower than the maximum allowed due to the current ecological condition of the allotments.

Table 6. Maximum forage utilization standards as described in the 1986 Toiyabe Forest Plan[1] the Sierra Nevada Forest Plan Amendment[2], and the Greater Sage Grouse Bi-State DPS Forest Plan Amendment[3]. Standards for 'Non-Functioning' condition class derived from ID team assessments to adequately protect resources[4]. Condition class terms are derived from the forest plans and are used interchangeably. Where pertinent, changes in utilization standards from Forest Plan Amendments are shown. Standards that are less restrictive are superseded by more stringent standards.

Management System	Vegetation Type	Maximum Percent Utilization					
		GRASS OR FORB			SHRUB		
		Condition Class			Condition Class		
		Unsatisfactory[1] (Early Seral[2]); (Non-Functioning[4])	Unsatisfactory[1] (Early-mid Seral[2]); (Functioning-at-Risk)	Satisfactory[1] (Late Seral[2]); (Functioning[3])	Unsatisfactory[1] (Early Seral[2]) (Non-Functioning[4])	Unsatisfactory[1] (Early-mid Seral[2]); (Functioning-at-Risk)	Satisfactory[1] (Late Seral[2]); (Functioning[3])
Rest Rotation or Deferred	Aspen, Sagebrush, Mountain brush and Grassland,	35%[4]	45%[1]	45%[3] (Toiyabe FP=55%)	20%[4]	35%[3] (Toiyabe FP=40%)	40%[2] (in non BSSG* habitat) 35%[3] (within *BSSG habitat) (Toiyabe FP=50%)
	Riparian/ Meadow	20%[4]	30%[2]-Minimum 6"stubble ht. (Toiyabe FP=55%)	40%[2]-Minimum 4"stubble ht. (Toiyabe FP=65%)	10%[4]	20%[2] (Toiyabe FP=25%)	20%[2] (Toiyabe FP=35%)

*BSSG= Bi-state sage grouse

Table 7. Ecological Conditions and Proposed Proper Use Criteria by Habitat Group and Allotment.

UNITS WITHIN THE ALLOTMENTS	HABITAT GROUP/PROPER USE CRITERIA									
	ALPINE			RIPARIAN/MEADOWS				UPLANDS (brush, aspen, non-meadow grasslands)		
	Ecological Condition	Allowable Utilization		Ecological Condition	Allowable Utilization		Streambank Alteration[3]	Ecological Condition	Allowable Utilization	
		Woody	Herbaceous		Woody (willow, aspen)	Herbaceous			Woody	Herbaceous
Leviathan Allotment										
Leviathan Unit	N/A	N/A	N/A	FR	20%	30%	20%	FR	35%	40%
Campbell-Loope Allotment										
Poor Boy Unit	N/A	N/A	N/A	FR	20%	30%	20%	FR	35%	40%
Lexington Unit	N/A	N/A	N/A	FR	20%	30%	20%	FR	35%	40%
Mogul Unit	N/A	N/A	N/A	FR	20%	30%	20%	FR	35%	40%

(F = Functioning, FR = Functioning-at-Risk, NF = Non-functioning)
(N/A= There are no community types classified as 'Alpine' within the allotment boundaries)

Table 8. Summary of Initial Grazing Strategy for the Leviathan-Loope Rangeland Project

ALLOTMENT	ACRES	PERMITTED HEAD MONTHS	PERMITTED SEASON OF USE	UTILIZATION UPLANDS		UTILIZATION RIPARIAN MEADOWS		STREAMBANK DISTURBANCE	GRAZING STRATEGY
				Herbaceous	Woody	Herbaceous	Woody		
Leviathan	8,975	NTE 4,416	May15th-October 31st	40%	35%	30%	20%	20%	Deferred
Campbell-Loope	15,093	NTE 3,038	May 15-October 31st	40%	35%	30%	20%	20%	Deferred/Rest Rotation

Developments and Improvements

The Leviathan and Campbell-Loope portions of the project area contain several existing water developments that are both currently operational and non-operational (Figure 2). Under the Proposed Action, the Leviathan Allotment would include maintaining seven existing stock ponds/catchment basins; and replace two existing spring developments. The California Spring Development includes two options for trough placement. On the Campbell-Loope Allotment, it would include improving/maintaining two existing spring developments; replacing one non-functional spring development; and develop one new spring and one existing well development to include pumps, pipes, tanks and troughs.

The proposed Road 311 Spring Development includes two options for the spring box location and trough placement. Catchment basins/spring box will be placed in the head of the spring or within the stream channel. Reconstruction and new improvements will be designed by Natural Resource Conservation Service (NRCS) or Forest Service engineers to limit the effects to the spring or water source. Water collection at each spring site will be designed to not take all the water flow into the pipes. A portion of the water from a spring would be allocated to protect the viability of the dependent ecosystem (USDA 2007). The spring developments will be fitted with control valves that can shut off water to a trough when the troughs are not needed. The water that flows beyond the points of catchment/diversion will continue to flow in the creeks. A solar or generator-powered pump, pipes (poly-pipe), water tanks (for some), and sheep troughs will be installed. Sheep watering troughs will be fitted with wildlife escape ramps. A small backhoe would be necessary to level the trough and tank placement site; create the gravel apron underneath the troughs; and possibly used to place the tanks/troughs. Additional maintenance in the future would be required with the use of a backhoe.

The proposed spring developments will disperse livestock over additional capable acres for grazing that have not been grazed due to lack of reliable water. It will distribute livestock more evenly through the units which will help improve range conditions- allotments wide. There will be a decrease in the amount of time sheep spend at the current developed springs/troughs. Access to water developments is controlled by a herder; which will help moderate use in these areas. Design features (discussed above) were incorporated into Alternative 1 (Proposed Action) to minimize impacts from water development replacement and new construction would be minor and short-term. Tables 9 and 10 describe what is proposed at each water development on the Leviathan and Campbell-Loope Allotments:

Table 9. Existing and proposed water developments for the Leviathan Allotment.

Improvement	Proposed Action
California Spring and Troughs	Reconstruction, or new Improvement
	Option 1: Replace the existing non-functioning troughs with new troughs, staying within the original footprint. Option 2: Develop a new trough location which would bring the troughs closer to the spring source. Common to both options: Replace the CMP at the spring source, install a solar or generator-powered pump, install new pipe (above ground) approx. 600-1000 feet; install 20-60ft. of water troughs with gravel apron underneath, and an outlet pipe. Backhoe will be used to level ground for trough placement, and gravel apron. Wildlife ramps will be placed in troughs.
High Peak Spring and Troughs	Reconstruction

Table 9. Existing and proposed water developments for the Leviathan Allotment (Continued)

Improvement	Proposed Action
	Install a vertical CMP at spring source, install solar or generator-powered pump, and up to 200ft. of pipe, install 20-60ft. of sheep troughs (4 troughs currently), outlet pipe, a gravel apron, and wildlife ramps. Backhoe will be used to level ground for trough placement, and gravel apron.
Big Spring Stock Pond (spring and pond)	Maintenance
	Spring source with dug out reservoir/pond. Use backhoe for future maintenance as needed.
125WPD09 Spring, Pond	Maintenance
	Spring source with dugout reservoir/pond. Rocks line the banks. Use backhoe for future maintenance as needed.
Virgil Connell Spring (catchment basin)	Maintenance
	A dugout catchment reservoir/pond to hold water from spring runoff. Use backhoe for future maintenance as needed.
89 Stock Pond (Catchment basin)	Maintenance
	A dugout catchment reservoir/pond to hold water from spring runoff. No historical spring source. Use backhoe for future maintenance as needed.
Monitor Pass Stock Pond (catchment basin)	Maintenance
	Catchment reservoir/pond to hold water from spring runoff. No historical spring source. Use backhoe for future maintenance as needed.
125WPD10 (catchment basin)	Maintenance
	Catchment reservoir/pond to hold water from spring runoff. No historical spring source. Water hauling location with temporary troughs. Use backhoe for future maintenance as needed.
Indian Springs/Pond	Maintenance
	Spring source with dug out reservoir/pond. Use backhoe for future maintenance as needed.

Table 10. Existing and proposed water developments for the Campbell-Loope Allotment.

Improvement	Proposed Action
Herder Spring development & Troughs	Maintenance
(Lexington Unit)	Improve and repair existing troughs as needed (8 troughs). Replace current water holding tank (1,500 gallons) with a 3,000-gallon water tank- same footprint. 200ft.-300ft. of 1.5"-2" poly pipe to fill tank and return flow to riparian area. Install wildlife ramps. Use backhoe for future maintenance as needed.
Sheep Spring development & Troughs	Maintenance

Table 10. Existing and proposed water developments for the Campbell-Loope Allotment (Continued)

Improvement	Proposed Action
(Mogul Unit)	Improve and repair existing troughs as needed (12 troughs). Pipe is laid underneath the road. Possible placement of new holding tank if necessary due to loss of water: 1,500-3,000-gallon tank. 200 ft. of poly pipe. Continue to allow backhoe use if replacement of troughs or tank is necessary in the future for maintenance. Install wildlife ramps.
Curtz Mine Well & Trough Development	New Development
(Lexington Unit)	Use the 10" vertical pipe with wires coming up from the ground- it is either just a pipe or pipe and buried tank. Due to the sites eligibility, we are not authorizing a backhoe to dig up the pipe and/or associated tank. The water will be tested prior to development. A solar or generator-powered portable pump will be installed. A backhoe will be used to level out an area adjacent to the pump for a 1,500-3,000-gallon portable water tank, and the backhoe will be used to place it. Approximately 500'-1000' of poly pipe at 1 1/4"-2" diameter will gravity-feed water downhill to the troughs, which will be out of the eligible site. Pipe will remain aboveground. A backhoe will be used for leveling the ground, installing the gravel apron, and placing 60ft. of troughs (8-12 sheep troughs). An outlet pipe and wildlife ramps will also be installed. Authorize backhoe use if replacement of troughs or tank is necessary in the future for maintenance.
Rd. 311 Spring development & Troughs	New Development
(Mogul Unit)	Option 1: Utilize existing spring to place a CMP catchment basin, pipe and portable pump (solar or generator-powered). 1.25" – 2" diameter poly pipe to transport water 300'-1000' to the east. This pipe would remain aboveground, and end at a 1,500-3,000-gallon capacity tank. A backhoe will be used to level the ground for the water tank, gravel apron, and trough placement for 60ft. of gravity-fed sheep troughs. An outlet pipe and wildlife ramps will be installed. Authorize backhoe use if replacement of troughs or tank is necessary in the future for maintenance. Options 2: Install a CMP catchment basin within the creek utilizing either a small backhoe or hand tools and install a portable pump (solar or generator-powered). A 1.25" – 2" diameter poly pipe to transport water 300'-600' to the west. This pipe would remain aboveground, and end at a 1,500-3,000-gallon capacity tank. A backhoe will be used to level the ground for the water tank, gravel apron, and trough placement for 60ft. of gravity-fed troughs. An outlet pipe and wildlife ramps will be installed. Authorize backhoe use if replacement of troughs or tank is necessary in the future for maintenance.
Poor Boy Spring development & Troughs	Reconstruction
(Indian Unit)	Improve historic spring development and replace troughs- remain within its original footprint. Use a backhoe to level the ground for a portable water tank, place a gravel apron, and place the new troughs- approximately 60ft. of 8-12 sheep troughs. Install a 1,500- 3,000-gallon water tank. Pipe would remain aboveground. An outlet pipe and wildlife ramps will be installed. Authorize backhoe use if replacement of troughs or tank is necessary in the future for maintenance.

Figure 2: Leviathan Allotment proposed and existing water developments

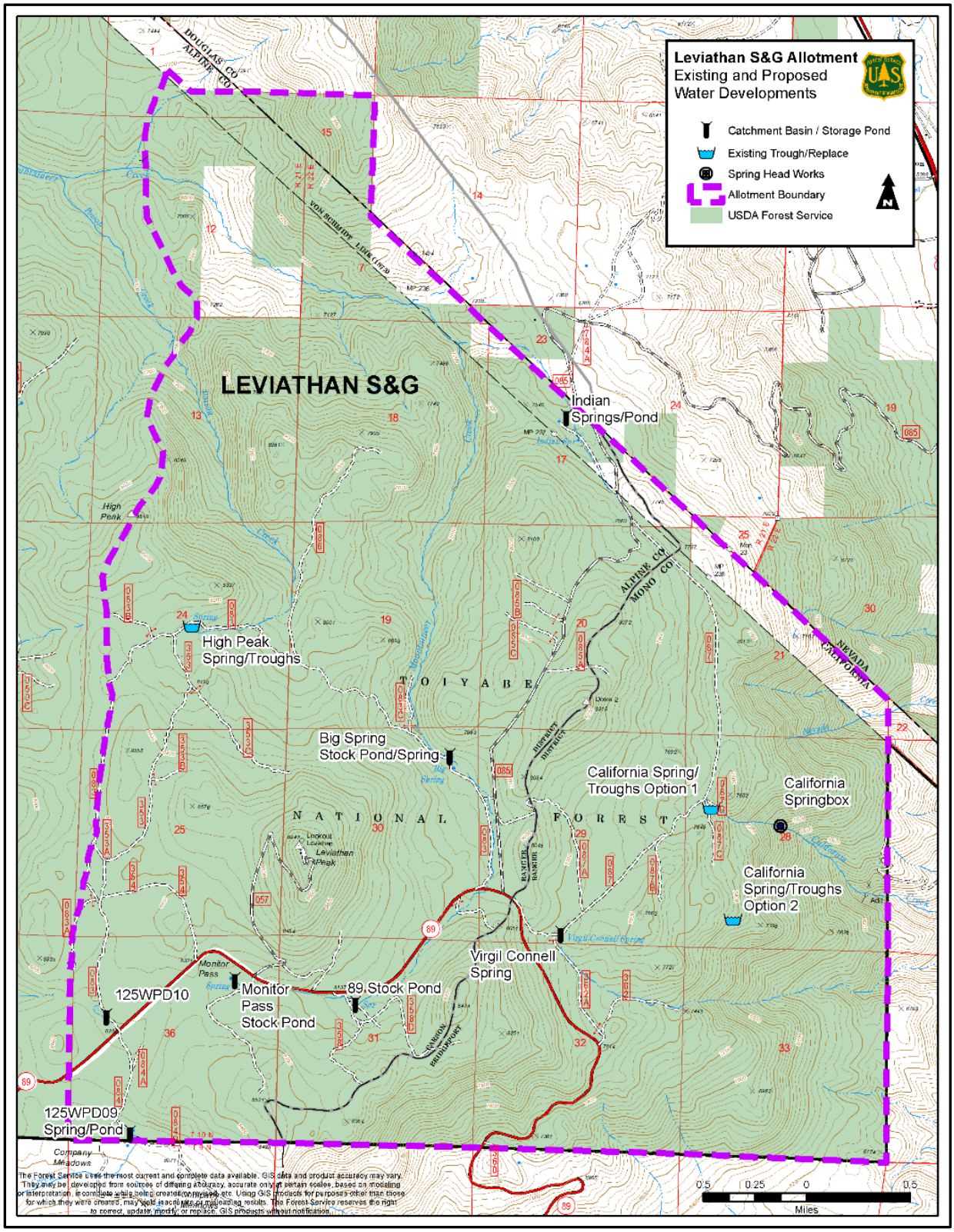
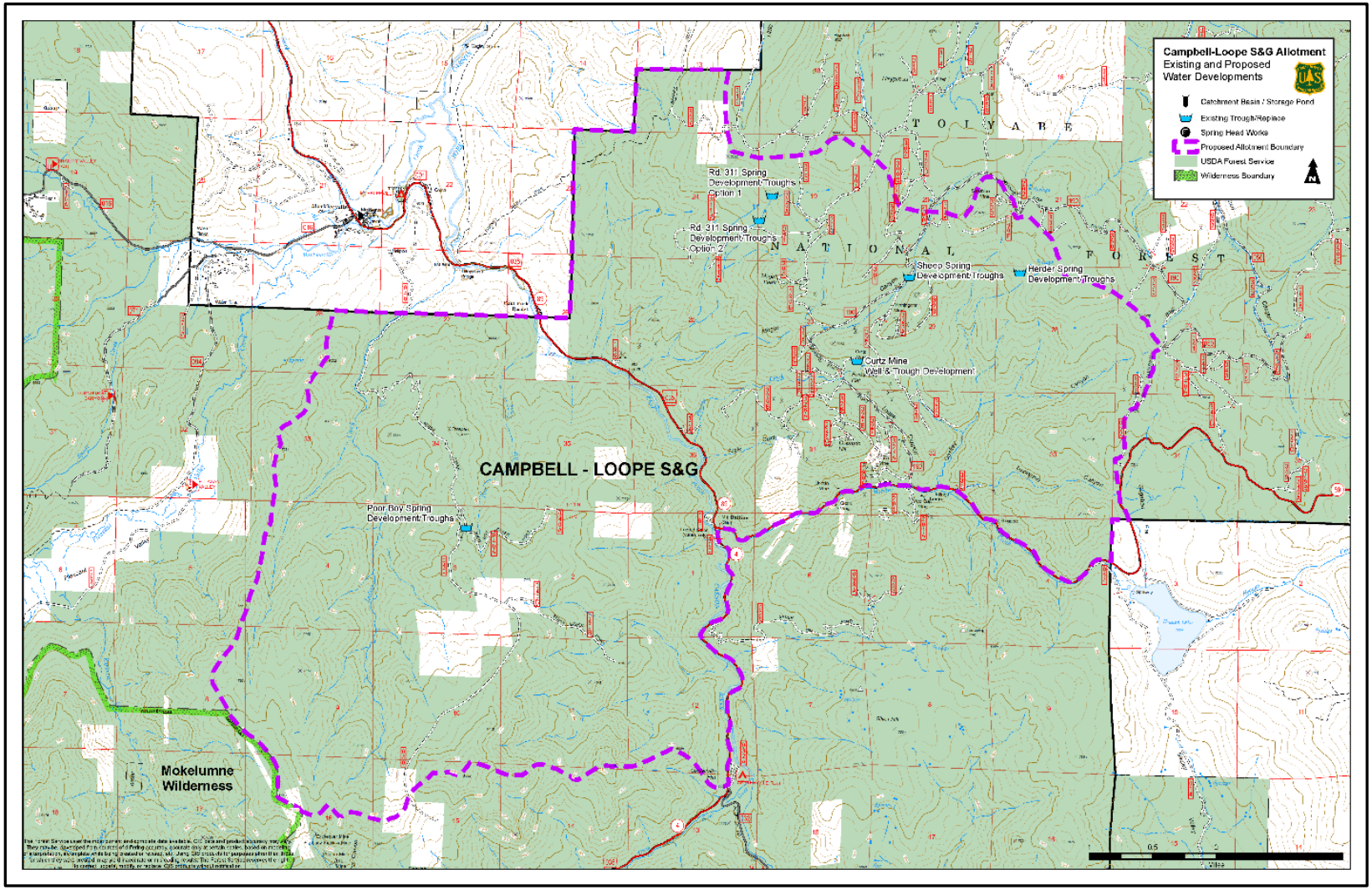


Figure 3: Campbell-Loope Allotment proposed and existing water developments



Monitoring

Monitoring has the dual purpose of ensuring compliance with the design features and proper use criteria for an allotment, and for determining whether the current management of the allotment is maintaining or moving the area toward functioning condition.

Implementation and focused effectiveness monitoring are necessary to determine when or if management changes should be made and to guide the direction that those changes take. Under the Proposed Action, monitoring would occur at varying levels on the Leviathan and Campbell-Loope Allotments annually. The Forest Service would invite participation from rangeland users and other interested parties where feasible. The below provides a summary of monitoring strategies that will be used in the Project area. For a more detailed description of monitoring and the various management tools used to respond to monitoring results, see Appendix E.

Key Areas

Because the acreages these allotments cover is vast and soil and vegetation parameters cannot be monitored on every part of an allotment, the "key area concept" would be used for short-term and long-term monitoring efforts. A key area is a relatively small portion of rangeland that because of its location, grazing or browsing value, and/or use serves as a monitoring and evaluation site that is representative of conditions in the larger area. A key area guides the general management of the entire area of which it is a part and would reflect the overall acceptability of current grazing management over the range. Key areas can be a short segment of stream or a small upland area. A key area can also be an entire stream reach or large upland basin.

The initial key area locations for short-term and long-term monitoring for each allotment are included in the draft AMPs in Appendix B. The locations of key areas for monitoring may be changed or adjusted over time as conditions change or new information becomes available. The process for selecting key areas is described in the draft AMP located in Appendix B.

Implementation Monitoring (Short-Term)

Short-term monitoring would be used to determine if the actions described under Alternative 1 (Proposed Action) are being implemented as planned and are meeting the proper use criteria and design criteria. It could also be used to conduct limited tracking on ecological condition and trend. Short-term monitoring encompasses a wide variety of monitoring activities. Overall monitoring of conditions on the Carson Ranger District, including the project area, occurs every year. This kind of monitoring is based on general observations of rangeland conditions by the Forest Service and reports from other visitors to the project area. This work is done in conjunction with rangeland management, as well as other resource management activities (i.e., fisheries, wildlife, archaeology, etc.). This information would be evaluated to determine if additional monitoring emphasis is necessary in a particular allotment.

Effectiveness Monitoring (Long-Term)

Long-term monitoring would be used to determine if the proper use criteria and grazing management guidelines included in this alternative and the AMPs are effective in moving resources towards functioning ecological conditions and ensuring an upward or stable trend in resource conditions. Long-term monitoring would gauge the success of allotment management by comparing evaluations on rangeland condition and trend against previous evaluations. Rangeland condition (functioning, functioning-at-risk, non-functioning) has been discussed in detail above. Trend is characterized as "toward potential," "away from potential," or "static" (SRM 1989) or "direction of change over time" (FSH 2209.21). The appraisal of trend is simply the recognition of the nature, rate, and direction of ecological change (USDA FS 1951).

Appendix E, as well as the Range and Vegetation Specialist reports, include detailed information on monitoring strategies involved with both short-term and long-term monitoring.

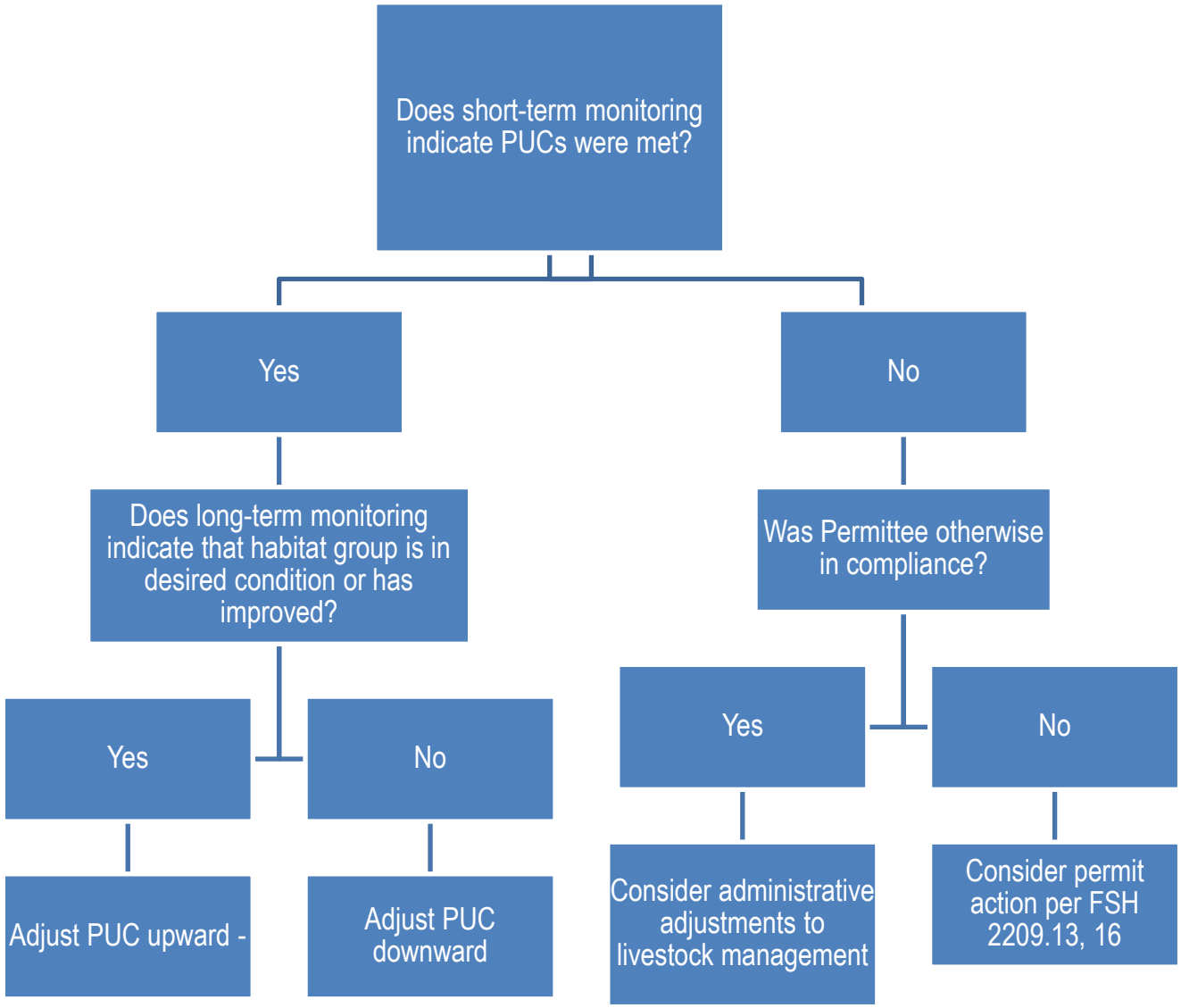
Management Adjustments Based on Monitoring

As discussed throughout this EA, the information obtained from short-term and long-term monitoring would be evaluated to determine if grazing management of an allotment should be adjusted. If adjustments were necessary, they would be included in the next year's annual Operating Instructions (AOIs) and allotment specific monitoring sites and schedules would be included within the AMPs (See Appendices B and E).

Based on the successes or failures observed through short-term and long-term monitoring, adjustments to grazing strategies would be made. As discussed above, short-term monitoring would occur annually, and long-term monitoring would generally occur on a 5-8-year cycle. The information obtained through this monitoring effort would be evaluated to determine if management of an allotment should be adjusted. The flowchart included below (figure 4) coincides with the Management Tools tables in Appendix E and displays how monitoring results would be used to determine whether adjustments to grazing management are warranted and what kind of adjustments would be made. If adjustments are necessary, they would be included in the following year's Annual Operating Instructions (AOIs).

As the flowchart indicates, monitoring results could lead to several different kinds of adjustments to livestock grazing or management. In some circumstances, prescribed adjustments would be made to the proper use criteria (PUC) if ecological conditions decline or improve. Other situations would call for administrative adjustments, including a temporary reduction on within season triggers and proper use criteria, or a temporary reduction in the number of livestock on the allotment. New grazing improvements, such as fencing or water developments that weren't analyzed in this EA, would require additional environmental analysis. Finally, if the permittee is not in compliance with the terms of their permit, administrative action on the permit may be warranted. Only the prescribed adjustments to the proper use criteria are part of the Proposed Action. The administrative actions are included in this discussion to provide a complete picture on how the monitoring results would be applied.

Figure 4. Process used to determine management adjustments based on monitoring. Flow chart coincides with Management Tools Table in Appendix E. (*PUC= proper use criteria).



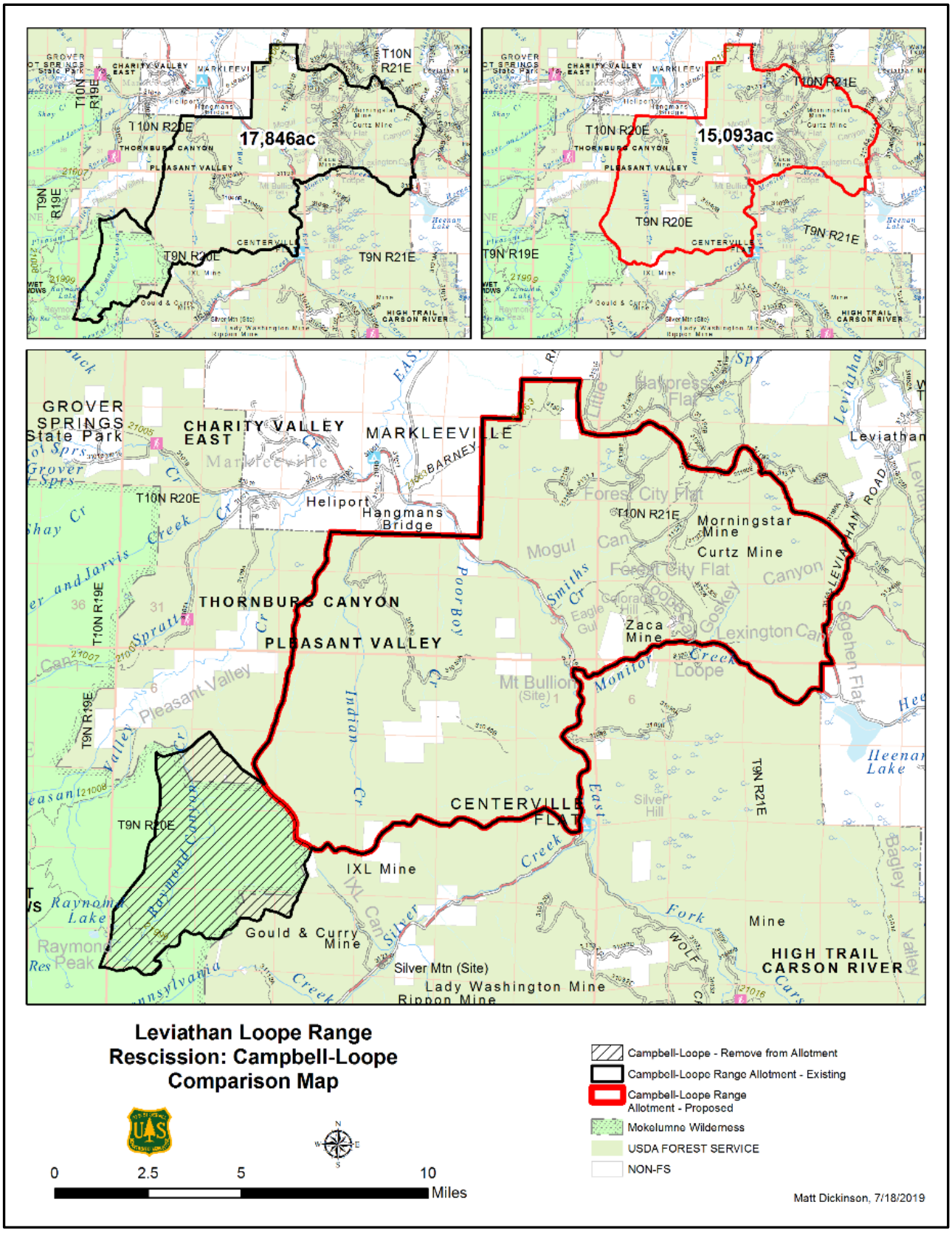
Allotment Management Plans

As part of the permitting process, an Allotment Management Plan (AMP) would be developed for each allotment. This document incorporates Forest Plan management direction and other applicable laws, policies and programs (such as consultation with U.S. Fish and Wildlife Service), and direction from the project-level National Environmental Policy Act (NEPA) decision to provide specific management prescriptions for areas where grazing use is authorized. Each AMP would include goals and objectives for livestock management, appropriate stocking levels, livestock distribution strategies, range improvement needs, and any pertinent travel management guidelines or restrictions (FSH 2209.13 Chapter 90). Each AMP would also include a monitoring plan to help assure the grazing strategy is meeting the desired condition of the allotment. Draft versions of the new AMPs are included in Appendix B.

Modify Allotment Boundary

Under the Proposed Action the Campbell-Loope Allotment boundary would be redefined to exclude areas that are largely inaccessible to livestock and contain only small, non-contiguous patches of forage. The overall boundary adjustment will result in reducing the Campbell-Loope Allotment from approximately 17,846 acres to approximately 15,093acres (Figure 5). As a result of the adjustment, the Mokelumne Wilderness area would no longer be included in the allotment boundary. The removal of wilderness from the permitted area is based on the limited number of capable acres as well as poor access to the area. In general, however, livestock grazing is an acceptable use in wilderness areas and is consistent with provisions in the Wilderness Act and the Congressional Grazing Guidelines (USDA FS 2007a, FSM 2323.23).

Figure 5. Revised boundary for the Campbell-Loope Allotment



Closure of Mud Lake, Barber, and Double Springs Allotments

Under the Proposed Action, Mud Lake, Barber, and Double Spring Allotments will be closed (Figure 1). These allotments total 4,359 acres (Table 1) and are isolated land areas surrounded by either private or other agency lands and are not part of an active or feasible grazing system. Since they have been in Forest Service ownership, only the Barber Allotment was permitted for grazing, and that was in the 1990's. A Decision Notice signed in 1980 determined the allotment would be closed for wildlife management values once the permittee was no longer interested in owning the permit. The grazing permit was waived back to the Forest Service in 1996. It is unclear why the allotment was not closed at this time. The Forest Service felt it was prudent to revisit the closure again in this analysis. The Mud Lake Allotment also contains valuable habitat for wildlife that exceed the potential grazing benefits. A 20-acre wetland in this small allotment attracts numerous migratory birds, mule deer and other wildlife. The Forest Service is currently actively engaged in restoring the wetland habitat which is being threatened by noxious weed infestations.

Resource-Specific Design Features

Soil and Watershed Resources

- Avoid impacts to fragile riparian soils and vegetation, no bedding, resting or other concentrated livestock use would occur within .25 miles of a stream or other waterbody.
- Ground disturbing work such as digging soil to improve water developments, will occur in the fall, or when spring flows are low, and soils are dry and more durable.
- Development or improvement work at spring sites will be monitored by resource specialists to prevent undesirable impacts to resource values.

Wildlife and Aquatic Resources

- A portion of the project area is located within the Pine Nut Population Management Unit (PMU) for Bi-state Sage Grouse and proposed critical habitat for bi-state sage grouse. There is no known nesting or lekking sites within or near the project area. As part of the Proposed Action, all pertinent standards and guidelines as described in the Record of Decision for the Greater Sage-grouse Bi-state Distinct Population Segment Forest Plan Amendment (USDA 2016) will be followed to continue to attain desired habitat conditions for Bi-state sage grouse.
- All water developments will be designed and fitted with wildlife escape ramps that meet Bat Conservation International Standards (Taylor and Tuttle 2007).

Sensitive and Rare Plants

- Unoccupied potential habitat for rare plant species was discovered in the project area during surveys. If rare plants are documented in the project area in the future, plants will need to be flagged and avoided or otherwise protected as determined by the district or forest botanist.

Noxious/Invasive Weeds

- To avoid inadvertently transporting noxious weeds to other locations, livestock will not be authorized to graze or trail through known noxious or invasive weed populations.
- The permittees will be responsible for coordinating with the Forest Service immediately when new infestations of noxious or invasive weeds are discovered on their allotment.
- Equipment used to install or maintain water developments would be thoroughly cleaned prior to entering National Forest System lands to avoid inadvertent transport of noxious and invasive weed seeds.

- As per the Noxious Weed Order 36 CFR 261.58(t)/regional order 04-00-097, any hay that is brought onto the National Forest will be federally certified "Noxious Weed Free Forage."
- Prior to arrival to the project area, sheep will either be quarantined, or fed weed free forage for at least 3 days.
- As part of the Carson Ranger District Weed Management Program, weed infestations located in the Leviathan-Loope Rangeland Project area will be mapped and treated on an annual basis.
- Additional BMPs found in Appendix B will be incorporated into the Allotment Management Plans and Term Grazing Permits for the prevention and control of weeds within the project area (FSM 2000).

Cultural Resources

- The AOI shall be reviewed to determine if additional cultural resource inventory is needed, and to ensure that cultural resource concerns are conveyed.
- Cultural resources near high use areas (watering and bedding locations) shall be monitored on a periodic basis to ensure standard resource protection measures are effective.
- If adverse effects to sites eligible or potentially eligible for inclusion in the National Register of Historic Places are identified in the future, additional protection measures will be required to prevent additional impacts.

Recreation

- To minimize potential impacts to recreation, when feasible, sheep crossing the East Fork Carson River will be limited to weekdays as well as avoid federal and state holidays when recreation use is typically greater.
- To minimize potential impacts to roadless characteristics, when feasible, maintenance activities on the Poor Boy spring/troughs will be limited to weekdays, as well as avoid federal and state holidays when recreation use is typically greater.

2.3.2 Alternative 2. No Action Alternative

No action" is synonymous with "no grazing" and means that livestock grazing would not be authorized within the project area (FSH 2209.13, 92.31). Alternative 2 (No Action/No Grazing) is the no action alternative for this EA.

Alternative 2 (No Action/No Grazing) would not authorize grazing on any of the allotments within the Leviathan-Loope Rangeland Project area (figure 1). Compared to Alternative 1 (Proposed Action), Alternative 2 (No Action/No Grazing) would result in two sheep allotments in the project area to become vacant, and three cattle allotments to remain vacant. Existing improvements that are no longer functional or needed including water developments, interior fences, and cattleguards may be removed over time as allowed by funding and management priorities. Furthermore, no new spring developments would be constructed on the Leviathan and Campbell-Loope Allotments.

Chapter 3. Environmental Effects

3.1 *Introduction*

This section summarizes the potential effects of the proposed action and alternatives. An interdisciplinary team of District resource specialists reviewed the Proposed Action and alternatives and assisted in evaluating resource effects. Though considered and analyzed for this EA, environmental effects are not discussed at length, pursuant to 40 CFR 1500.4(c). The following Specialist Reports are part of the project record and are incorporated by reference throughout this section (and the EA). These reports are also available upon request:

- Range
- Vegetation, Weeds Risk Assessment
- Terrestrial and Aquatic Wildlife (Specialist Report and Biological Evaluation/Biological Assessment)
- Botany Biological Evaluation and Summary Report
- Cultural Resources
- Watershed and Soils
- Recreation and Inventoried Roadless Area

Complete copies of the resource reports are available for public review at the Carson Ranger District Office, by request. Resources that were not impacted and therefore not further analyzed include: Fire and Fuels Management, Air Quality, and Timber Management.

Analysis Area and Analyzing Effects

The Analysis Area to determine direct, indirect, and cumulative effects was defined by each resource area and is discussed in more detail in resource specialist reports. Different Resources may use different analysis areas for direct effects and cumulative effects.

Environmental consequences are the effects of implementing an alternative on the physical, biological, social, and economic environment. The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) included a number of specific categories for use in the analysis of environmental consequences. Several are applicable to the analysis of the proposed project and alternatives and form the basis of much of the discussion that follows. They are explained briefly here.

Direct and Indirect Effects

Direct environmental effects are those occurring at the same time and place as the initial cause or action. Indirect effects are those that occur later in time or are spatially removed from the activity but could be significant in the near future.

Cumulative Effects

A cumulative effect is the consequence on the environment that results from the incremental effect of the action when added to the effects of other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes the other actions and regardless of land ownership on which the actions occur. An individual action when considered alone may not have a significant effect, but when its effects are considered in sum with the effects of other past, present, and reasonably foreseeable future actions, the effects may be significant. The cumulative effects analysis in this EA is consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008).

This section overviews the activities potentially considered for cumulative effects analysis as conducted for each resource that may be directly or indirectly affected by the Action Alternatives. Table 11 provides a tabular display of past, present, and reasonably foreseeable future management activities and natural processes within or adjacent to the analysis area. This information was used by Forest Service resource specialists when conducting cumulative effects analyses for the Leviathan-Loope Environmental Assessment. Each resource specialist established geographic and temporal boundaries for their respective cumulative effects resource analysis, and determined past, present and reasonably foreseeable future effects that are relevant within their respective boundaries. Actions described in Table 11 were relevant to most of the resources. Findings regarding cumulative effects for each pertinent resource are described in the resource summaries in following sections.

Table 11. Summary of potential cumulative effects actions within the Leviathan-Loope Project analysis area.

Incident or Project Name	Years of Interface within Project Area	Description of Impacts within Project Area	Acres or Areas Affected within Leviathan-Loope Project Area
Past and Present Actions			
Slinkard Wildfire*	2017	Impacted upland vegetation groups in Leviathan Allotment at Virgil Connel Spring. Noxious weeds were scattered in small patches throughout the burn area, leading to a high risk for new infestations within the fire perimeter to become established	2,860 acres in Leviathan Allotment
Washington Wildfire*	2015	Consumed a large portion of the east side of the Campbell-Loope allotment, which was historically most utilized and capable portion of the allotment. In noted area, consumed conifer component, impacted existing range improvements	6,570 acres in the Campbell-Loope allotment
Monitor Pass Habitat Improvement Project	Approved in 2016; Ongoing	Remove select conifers to improve the condition of aspen stands and sage grouse habitat	Eastern half of the Leviathan grazing allotment.
California Integrated Weed Management Project	Approved in 2018; Ongoing	Treatments for noxious weeds involve integrated prescriptions that generally combine the use of manual (hand pulling and digging), herbicides, and biological control methods over several years. The project includes treating existing populations as well as any future infestations that might occur.	Known and future infestations of noxious or invasive weeds throughout project area within California
OHV and Dispersed Recreation, Personal fuelwood cutting	Ongoing	The Loope Canyon road and other roads, in the Campbell-Loope Allotment are popular OHV use. The Monitor Pass area is also popular for dispersed recreation such as camping, particularity in aspen areas. Increased potential for minor cumulative impacts to soil and water quality and biological resources.	Near roads associated with Campbell-Loope and Leviathan Allotments

Incident or Project Name	Years of Interface within Project Area	Description of Impacts within Project Area	Acres or Areas Affected within Leviathan-Loope Project Area
Foreseeable Future Projects			
Leviathan Peak Communication Tower	Construction is expected to occur over a two-year period starting sometime in (2021-2023)	The construction, operation and maintenance of new communication facilities including a tower, building, solar arrays, propane tanks and the removal of the existing facilities, including the lookout.	Area of disturbance during removal, construction and restoration totals up to 6,000 square feet. Total area of permanent disturbance is approximately 1.6 acres. Project located approximately 10 miles south east of Markleeville, CA accessible from Highway 88 Monitor Pass and Leviathan Lookout Road 31057

* See Vegetation Specialist Report for more detail on the fire extent and burn severity from the Washington and Slinkard Wildfires within the Campbell-Loope and Leviathan Grazing Allotments.

3.2 *Resources*

3.2.1 Vegetation

Rangeland health is the degree to which the integrity of the soil, vegetation, water and air, and the ecological processes of the rangeland ecosystems are balanced and sustained (O'Brien et al. 2003). Maintaining the health of the sagebrush, riparian, aspen, and forested ecosystems within rangelands is important for wildlife and their habitat, watershed values (such as water quality and quantity), and livestock grazing. Vegetative components of rangeland health include the composition (variety and amount of different plant species), ground cover (area covered or protected by vegetation or litter), and structure (height, width, and density of plants within the plant community).

Livestock grazing has the potential to affect the composition, structure, and health of the various vegetative communities in the project area. Grazing also has the potential to introduce and/or expand noxious weed infestations within these vegetative communities. These effects would impact the functioning of natural ecological processes, such as the capture, storage, and redistribution of water; conversion of sunlight to plant and animal matter; and the cycling of nutrients through the physical and biological environments. Properly managed livestock can eliminate or minimize these negative impacts.

Table 12. Summary of potential effects to vegetation from the Proposed Action and No Action Alternatives

Indicator		Proposed Action: Alternative 1	No Action: Alternative 2
• ***Species composition (the percent of plants that indicates plant communities are functioning as desired)*** • ***Percent of bare ground (area not covered or protected by ground cover)***	*Meadows/ Riparian*	Proper use criteria and design features with flexible grazing strategies will reduce impacts from domestic livestock grazing and move the ecological condition of meadows and riparian habitat towards proper functioning/late seral conditions. This alternative will provide for improvements in plant vigor, composition, and density and provide vegetative biomass for streambank protection during the spring run-off. Percent of bare ground will be reduced.	Eliminates impacts from domestic livestock grazing to meadow and riparian habitat-bare ground is expected to decrease more rapidly, and habitat conditions for riparian and meadows are likely to move toward proper functioning condition/late seral; however, an accumulation of litter over a period of years can hinder herbage production in wet meadow areas. Eliminates impacts from domestic livestock grazing to willow species and moves toward functioning/late seral conditions.
	Water Developments	Will improve riparian, meadow and streambank conditions because of better livestock distribution and 3 new water developments would be placed in upland habitat. Percent of bare ground will not increase as water developments will be placed in upland, xeric plant communities that are less vulnerable to compaction.	No new water improvements would be developed, and existing ones would be removed over time. Habitat conditions for uplands will move toward satisfactory/functioning condition, possibly at a faster rate than Alternative 1. Bare ground near existing water developments would recover over time.
	Uplands (all brush categories, non-meadow grasslands, conifer)-	Proper use criteria and design features will move the ecological condition of upland habitats towards functioning/satisfactory condition. Unburned conifer habitats are currently functioning and would not drop below functioning condition. Concentrated use will shift to upland habitat due to new water developments.	Habitat conditions for uplands will move toward satisfactory/functioning condition, possibly at a faster rate than Alternative 1. No negative impacts from domestic livestock grazing on ground cover and organic matter. Understory vegetation and species composition would improve at a faster rate and percent bare ground would be reduced. Increased seedlings and species composition at a faster rate. Increase of litter and fine fuels which may increase fuel loading in the sagebrush community.

Table 12. Summary of potential effects to vegetation from the Proposed Action and No Action Alternatives (Continued)

Indicator		Proposed Action: Alternative 1	No Action: Alternative 2
	Aspen	Sheep grazing currently occurs primarily on the exterior of aspen stands where some aspen shoots and saplings occur. Most aspen stands in the units are densely thicketed and too difficult for sheep too maneuver in. Proper use criteria and design features included in Alternative 1 with applicable standards and guidelines and flexible grazing strategies would maintain or increase the success of recruitment of suckers and saplings, particularly those on the periphery of aspen stands.	Current grazing occurs primarily on the periphery of aspen stands which has some impact on aspen shoots and saplings in these areas. The No Action alternative would eliminate grazing of any aspen. Due to the identified ecological constraints on aspen in this area and the minimal grazing of aspen that currently occurs, removal of grazing is not likely to have a positive or negative effect on the health of the aspen stands in the project area.
Number of saplings or suckers in aspen	Some grazing of aspen seedlings and saplings will continue to occur, particularly on the periphery of aspen stands. Compared to current management, an increase in seedlings and saplings may increase over time as sheep will be moving more frequently through the allotments following the improvements to water developments.		Aspen seedlings and saplings are expected to increase at a faster rate than the proposed action; however, the difference is expected to be minimal due to the minor amount of grazing that occurs in aspen stands in the project area, as well as other factors affecting aspen growth such as ecological (soil type. etc.) and anthropomorphic (camping, etc.)
Increase/decrease in weed infestations	Proper use criteria and design features will move the ecological condition of range vegetation towards functioning/satisfactory condition thereby reducing the risk of noxious weed infestations. Under the Proposed Action, livestock will not be authorized to graze or trail through known weed populations which will reduce the risk of sheep inadvertently transporting weeds from unit to unit with the allotments.		Eliminates the potential for domestic livestock grazing to transport weeds; disturbance to ground cover will be minimized lowering the potential for invasive species.

The Vegetation Specialist Report assessed rangeland condition and analyzed potential affects from the project alternatives. The Leviathan-Loope Rangeland project area vegetation components are characterized by diverse plant communities of mixed conifer, pinyon-juniper woodland, mountain mahogany, sagebrush species, mountain brush, aspen, and wet and dry meadows and streams that create riparian corridors. Table 13 presents the distribution of dominant vegetation cover types across the project area. The Vegetation Report used the following indicators to consider effects:

- Species composition (the percent of plants that indicates plant communities are functioning as desired)
- Percent of bare ground (area not covered or protected by ground cover)
- Number of saplings or suckers in aspen
- Potential to introduce and/or expand noxious weeds and other invasive species

Not all the vegetative communities would be affected to the same degree by the Action Alternative, nor are all accessible or capable for livestock grazing. The vegetative communities with the potential to be most affected by changes in livestock grazing management over the expected life of this analysis are the uplands, riparian vegetation,

and aspen stands. The following text summarizes the potential effects to the vegetation that were evaluated in detail in the Vegetation Specialist Report.

Table 13: Leviathan-Loope Rangeland Project Area by Dominant Vegetation Cover Type

Cover Type	Acres in Project Area	Percent of Project Area	
Riparian (Wet, Dry, Dry-to-moist)	**99.0 (includes willow scrub)**	0.3%	
***Aspen**	**1,000.60**	3.3%	
Uplands**	**18,131.70**	**Upland sub-category percent composition**	59.3%
Mountain Big Sagebrush	5,089.20	28.1%	
Basin Big Sagebrush	2,619	14.4%	
Low Sagebrush	774.8	4.3%	
Basin Mixed Scrub	2,676	14.8%	
Mixed Sage/Bitterbrush	3,408.20	18.8%	
Other Mountain Shrubs	2,104.90	11.6%	
Grassland (annual grasses and herbs)	308.3	1.7%	
Curlleaf Mountain Mahogany	1,151.30	6.3%	
Pinyon/Juniper Woodland	**3,458.0**	11.3%	
Conifer Forest/ Woodland	**7,243.70**	23.7%	
Other (barren/snow/mining/Urban/Agriculture)	**644.5**	2.1%	
Total	**30,577.50**	100.0%	

*Acreage was calculated using Remote Sensing Applications Center (RSAC), Existing Vegetation Map of Humboldt-Toiyabe National Forest, as well as CALVEG data. Several years of ground verification has found an error pertaining to the amount of aspen. Many of the aspen sites are small and consequently were underestimated.

**The total upland acres is equal to the sum of the sub-categories of uplands. This value was included in the total number of acres in the project area.

3.2.1.1 Riparian Vegetation Group

Riparian vegetation communities are typically associated with meadows, seeps, springs and streams. Meadow types include dry to moist meadow types that are characterized by an abundance of grasses and forbs. The dry to moist meadow group areas are often the places where livestock concentrate first because of an increase in the abundance of grasses compared to uplands, and because the soils are not as saturated as in the wet meadows. Vegetation in the stream group ranges from steep gradient willow dominated streams to lower gradient systems with a mixture of meadows and willows. Willows provide habitat and shade to wildlife, stream bank stability, and root structures that withstand high water flows. Grazing can affect willow species due to browsing of new lateral shoot growth and young seedlings, particularly in the low gradient streams in the broad valley bottoms.

Alternative 1: Proposed Action

Riparian communities make up less than one percent of the project area but have the potential to show the most impacts from livestock grazing. Although a small percentage of the project area is riparian (less than 1%), proper

management of these areas is critical to the overall health of the entire project area. Implementation of the proposed action, including the proper use criteria and design features, would result in an upward trend in riparian communities such as wet and dry meadows, as well as seeps and springs.

The proper use criteria will be the driver for managing livestock use in riparian areas and are based on end of season utilization measurements on the various habitat types. The Toiyabe Forest Plan, as amended by the Sierra Nevada Forest Plan and the Greater Sage Grouse Bi-State DPS Forest Plan, requires maximum utilization of 40% on desirable herbaceous species for riparian areas that are properly functioning and more restrictive utilization (30%) on lower functioning or early seral conditions (see tables 6 and 7 in this EA and Range Specialist Report). In addition to meadows, seeps and springs, the Proposed Action would result in an upward trend in the condition of most stream communities. Maximum utilization standards for riparian woody species including willows would be set at 20 percent for functioning stream areas. In cases where the condition of the stream community is lower functioning or in early seral condition, utilization would be reduced to10%. To ensure end of season levels are not exceeded, appropriate within season triggers would also be applied. Proper riparian grazing strategies in stream zones will, at a minimum, (1) limit grazing intensity and season of use to provide sufficient rest to encourage plant vigor, regrowth, and energy storage; (2) ensure sufficient vegetation during periods of high flow to protect streambanks, dissipate stream energy, and trap sediments; and (3) control the timing of grazing to prevent damage to streambanks when they are most vulnerable to trampling. The proposed action will promote a healthy meadow and riparian community.

Under the Proposed Action, all new water developments will be placed in upland areas and away from springs, seeps, wet meadows, and streams. Establishing watering locations in upland habitat will redirect sheep away from riparian vegetation and decrease grazing pressure on willows (and other shrubs) in stream zones as well as potential impacts to meadow areas. Under the Proposed Action, a herder is with the sheep 24 hours a day and can readily move sheep out of riparian areas and meadows when necessary. The incorporation of new water developments, as well as improvements to existing ones, will allow sheep to be distributed more broadly and more frequently throughout the allotments minimizing impacts to vegetation in any one area.

Under the Proposed Action, the season of use dates for both allotments will range from May 15 to October 31. These dates include earlier start dates and later off dates than what is currently permitted (Campbell-Loope: August 16th - October 10th and Leviathan: June 21-September 20th). The date changes are proposed to allow for more flexibility in managing livestock grazing and range conditions. Alternating grazing seasons between early, mid, and late season will vary the timing of plant exposure to grazing each year. Thus, species favored one year may be less favored another year. For example, grazing early to mid-season promotes the growth of deeply rooted perennial plants while grazing in the fall is beneficial for both seed and rhizome producing plants and results in less injury to vegetation. This grazing strategy is referred to as 'deferred rotation' and is designed to maintain species diversity, density, and productivity within riparian/meadow areas, and allow for the opportunity for rapid successional change to desired conditions. Under the Proposed Action, annual range readiness monitoring will continue to occur at the beginning of each grazing season and sheep will not be authorized to graze if conditions are not acceptable

Under the proposed action, there will be no effects to riparian vegetation in the allotments proposed for closure (Mud Lake, Barber, and Double Springs). These allotments have not been grazed for many decades therefore closing these allotments will have no net effect on riparian vegetation.

Alternative 2: No Action/No Grazing

The No Action alternative would remove livestock grazing from the project area. After removal, the condition of seeps, springs, and meadows is expected to improve; however, permanent removal of grazing would not guarantee sustained increases in herbaceous plant production. One study indicated the following: "the meadow reached peak production in six years and then declined until production was similar to the adjacent area grazed season-long"; and also "the accumulation of litter over a period of years seems to retard herbage production in wet meadow areas" (Clary and Webster 1989). Under the No Action Alternative, the condition of some streams is expected to improve (Myers and Swanson 1995). Willow communities would regenerate more rapidly on most streams. Streams that are dominated by early seral species such as Kentucky bluegrass would improve rapidly and over time the species

component would become more dominated by later seral species such as sedges (Schultz and Leininger 1990). Under the No Action Alternative bare ground is expected to decrease as grasses and forbs begin to recover.

3.2.1.2. Aspen Vegetation Group

Aspen is continuing to decline throughout the west, and fire suppression, livestock grazing, and conifer encroachment are recognized as players in the species overall decline (Kay 1997, Bartos and Campbell 1998, Mueggler 1988). Aspen stands represent approximately 3% of the Project Area. The majority of aspen stands occur within the Leviathan Allotment and are located in upland plant communities. Ecological monitoring conducted by the Forest Service determined that aspen stands in the project area are functioning at risk (see Vegetation Specialist Report). Decline in these stands is attributed primarily to ecological processes such as drought and subsequent disease, soil type and lack of disturbance. Some of the stands show impacts from livestock grazing which is attributed primarily to historic trespass incursions from a neighboring cattle allotment (see Vegetation Specialist Report). In general, sheep tend to graze on the exterior of aspen stands due to the difficulty of navigating the dense brush and down woody debris found in the understory of most aspen stands. Light-to-moderate browsing on species such as willow and aspen appears to have little adverse effect and, in some cases may stimulate growth. Improperly managed grazing, however, can result in the aspen overstory thinned out and permanent openings in the canopy may be created. If aspen sucker reproduction is inadequate to replace overstory mortality, snowberry, big sagebrush and other shrubs increase and eventually become dominant. Understory herbaceous species composition is considered as part of a functioning aspen stand. Stands with diverse, healthy understory with reduced bare ground would be more resilient to disturbance and invasion by weedy and noxious species

Alternative 1: Proposed Action

Under Alternative 1 (Proposed Action), the condition of aspen would be determined within each allotment. The Proposed Action sets proper use criteria and flexible grazing strategies for aspen communities that carefully controls the timing, intensity and duration of domestic livestock grazing using a 24-hour herder.

Maximum utilization in aspen communities allows for 40 % browse (measured at the end of the growing season) on the available seedlings and saplings. To ensure that these end of season levels are not exceeded, appropriate within season triggers would also be applied. Utilizations set to 40 % or less would result in an upward trend in the condition of most aspen communities by increasing the success of recruitment of suckers, seedlings, and saplings, as well as decreasing soil compaction and bare ground, and improving the understory species composition. In aspen stands associated with riparian areas, browsing on aspen will not exceed 20% of the annual leader growth and will not exceed more than 20% of individual seedlings. To ensure that these end of season levels are not exceeded, appropriate within season triggers would also be applied. Livestock would not be allowed to bed, noon, or salt within a ¼ mile of an aspen stand. This alternative would result in an upward trend in the condition of most aspen communities.

The proposed expanded season of use includes periodically allowing grazing during the late spring (May). In general, grazing during this time period can help promote deep rooted perennial plants and shift plant composition to more desired conditions. However, if too many sheep congregate in the aspen stands when soils are wet (such as early in the season), there is potential for soil compaction that could reduce the soils ability to absorb and retain water. This could contribute to drying out of the soils with an increase in bare ground and a change in the desired species composition. Under the Proposed Action, range readiness monitoring and within season triggers would prohibit grazing in or near aspen if soils were determined to be too wet or if herbaceous components are insufficient. Under the Proposed Action, no new water developments will be placed within aspen stands; The incorporation of new water developments, as well as improvements to existing ones will allow sheep to be distributed more broadly and more frequently throughout the allotments.

This alternative would result in an upward trend toward desired condition of most aspen communities by minimizing impacts from sheep browsing, which increases the success of recruitment of saplings and suckers, decreasing soil compaction and bare ground, and improving the understory species composition. Stands with diverse, healthy understory with reduced bare ground would be more resilient to disturbance and invasion by weedy and noxious

species. Specific sites may be impacted by other factors (dispersed camping), which increases soil compaction. Those sites may not improve under this alternative. Communities that are currently functioning as desired would continue to maintain that level.

Alternative 1 (Proposed Action) will have no effect on the allotments proposed for closure (Mud Lake, Barber, and Double Springs Allotments), due to the long-term absence of domestic livestock grazing in these areas and lack of aspen within them.

Alternative 2: No Action/No Grazing

Alternative 2 (No Action/No Grazing) would remove livestock grazing from the project area. After removal, the condition of aspen communities would move toward functioning condition at potentially a faster rate than the Proposed Action. Without livestock grazing, browsing of suckers, seedlings, and saplings would be reduced resulting in an increase in survival, particularly to those that occur on the periphery of aspen stands. Stands that are currently affected by other influences such as drought, genetic issues, and recreational impacts would remain stable or continue to decline.

3.2.1.3. Upland Vegetation Group

Upland range ecosystems are those typically dominated by sagebrush, juniper, mountain brush, mahogany, and forb communities. Associated herbaceous and woody vegetation provides for plant communities that are diverse in seral status and structure and provide food and habitat for wildlife, forage for livestock, and a variety of recreational opportunities including aesthetic values. The major sagebrush communities found in the project area are mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*), basin big sagebrush (*Artemisia tridentate ssp. tridentata*), mixed sagebrush/bitterbrush (*Purshia tridentata*), and low sagebrush (*Artemisia arbuscula*). Upland communities make up 59% of the project area and in general are functioning to functioning-at-risk with stable trends due to undesirable species composition (annual grass and forb species) and disturbance. Upland brush communities in the project area generally lack a diversity of age classes and are dominated by mature and over-mature plants. The previous lack of fire in the project area resulted in large patches of homogenous stands of mature sagebrush and conifer; however, the Washington (2015) and Slinkard (2017) wildfires burned a collective 9,430 acres within the project area, thinning thousands of acres of brush and conifer.

Alternative 1: Proposed Action

The proper use criteria for each upland community was identified in the Forest Plan (as amended by the Greater Sage Grouse Bi-State DPS Forest Plan) to maintain healthy plant growth to provide forage for livestock and quality habitat for wildlife, including the Bi-state sage grouse. Maximum utilization of mountain brush would be 45% for herbaceous species and 35% for browse in areas considered to be functioning-at-risk and would be lower for brush stands that are not functioning (see tables 6 and 7). The maximum utilization values would be measured at the end of the growing season and are expected to help ensure that plants would be able to produce adequate root growth to remain vigorous and healthy. Sufficient litter to help protect the soil is would remain at the end of the grazing season. Increased litter would result in increased organic matter content in the soil which would improve water-holding capability and eventually, seedling growth. More vigorous plants would be able to produce more seed, which is expected to increase seedlings and over time increase ground cover by desirable herbaceous species and decrease the amount of bare ground. To ensure utilization is not exceeded, appropriate within season triggers would be applied.

Review of existing literature showed that conservative grazing can increase forage production and improve vegetation composition on degraded rangelands, improving non-functioning areas further (Holechek et al. 1998). These levels of use are expected to result in moving mountain big sagebrush and mountain brush communities that are either functioning-at-risk or non-functioning to a more functioning condition. The time for recovery would depend on many factors including site capability and other factors such as fire and drought. Some uplands may require more active management, such as fire or mechanical treatment, to move the area toward functioning.

Under the Proposed Action, all new water developments will be placed in upland areas to reduce impacts to riparian vegetation. Establishing watering locations in upland habitat will direct sheep away from meadows, streams, seeps and springs and reduce potential impacts to these areas. Additionally, by providing multiple watering locations, livestock will be distributed more broadly and more frequently throughout the allotments. Access to water developments is controlled by a herder which will help moderate use in these areas. Additionally, design features, BMP's, and proper use criteria will minimize impacts from water developments to upland vegetation.

The proposed season of use dates for both allotments will range from May 15 to October 31. These dates include earlier start dates than what is currently permitted (Campbell-Loope-August and Leviathan is currently June) and later end dates (Campbell-Loope- October 10 and Leviathan – September 20). The date changes are proposed to allow for more flexibility in managing livestock grazing and range conditions and avoid grazing upland vegetation at the same time every year. The earlier on-date will also allow for flexibility in meeting strategic management goals such as using sheep to control cheatgrass infestations and contribute to the recovery of perennial grasses (fall grazing). However, under the Proposed Action, range readiness monitoring will continue to occur, and sheep will not be permitted to graze if conditions are not acceptable. In addition to range readiness monitoring, the proper use criteria as determined by the Forest Plan (as amended) will be the driver for managing livestock use in upland communities.

Alternative 2: No Action/No Grazing

Under the No Action alternative, sagebrush and mountain brush communities that are functional would be maintained, and the remaining ecological communities would continue to improve over time with more desirable herbaceous species in the understory. Bare ground would be reduced due to the retained vegetation cover from the lack of livestock grazing. Plant vigor and reproduction would improve as climate and soil potential allow. Over time, this alternative would result in the increase of litter and fine fuels which may, in the absence of other disturbance, result in increased fuel loading in the area as well as limit production of herbaceous species (Clary and Webster 1989).

3.2.1.4. Pinyon Juniper and Mixed Conifer Woodlands

Pinyon Juniper and mixed conifer woodlands are only minimally affected from sheep grazing in the project area and are therefore not analyzed in detail in this EA. For a more detailed assessment of these vegetation groups, please refer to the Vegetation Specialist Report.

Mixed conifer species make up nearly 24% of the dominant cover type within the project area and include single leaf pinyon pine *(Pinus monophylla)*, sierra juniper *(Juniperus occidentalis)*, white fir *(Abies concolor)*, and jeffrey pine *(Pinus jeffreyi)*. Manzanita and bitterbrush are the principal understory shrubs. A protocol for assessing mixed conifer stands has not been made because livestock grazing generally do not occur in this vegetation community. Based on the capability/suitability analysis, the majority of conifer stands in the project area are considered to be non-capable for livestock grazing. This is due primarily to conifers being in late seral condition with dense understory vegetation and down woody debris that is not conducive to sheep grazing. These areas have generally not been impacted by livestock grazing due to their locations/steep slopes, density, and lack of water.

Pinyon-juniper woodlands make up 11.3% of the project area, mostly Phase I and II; with a smaller portion in Phase III and occur primarily within the Campbell-Loope and Leviathan Allotments. Phase I pinyon-juniper stands are generally associated with sagebrush communities within the project boundary and in general provide adequate forage for livestock. Phase I stands include individual, isolated trees that are often considered to be in encroaching in sagebrush stands due to lack of disturbance. Pinyon-Juniper encroachment in the project area has been noted, particularly in the Leviathan Allotment where large expanses of sagebrush occur. Over time and in the absence of disturbance, pinyon-juniper woodlands can take over and replace sagebrush communities. Phase I pinyon juniper trees are also considered to be a threat to the bi-state sage grouse due to their ability to reduce habitat availability and the individual trees acting as perches for predators. Phase II and III stands are much denser stands and exhibit low understory production and are therefore not commonly utilized by livestock. The Washington and Slinkard Fires

consumed a large portion of the Phase 1 and some Phase II pinyon-juniper and essentially "treating" some of the pinyon-juniper encroachment, naturally. Additionally, Phase I junipers were removed within the Leviathan Allotment in 2018 and 2019 as part of the Monitor Pass Habitat Improvement Project.

Cumulative Effects to Vegetation Groups

Under Alternative 1 (Proposed Action), most other management actions and human activities that currently occur on the Carson Ranger District would continue resulting in impacts on vegetative resources and the spread of weeds. Livestock affect vegetative properties by removal of plant cover and through the physical action of their hooves. A healthy, vigorous vegetative biomass, maintained through proper utilization, in riparian and meadow areas, traps sediment, prevents erosion, and actually develop meadow systems. Under proposed light or moderate grazing intensities, adequate vegetation is maintained to protect the site, but excessive vegetation that causes water losses by transpiration and evaporation is removed. In areas where the vegetative community is unsatisfactory, resource conditions are expected to trend upward and improve overall health of the site through increased productivity or vigor of individual plants and decrease the amount of bare ground. The cumulative effect of grazing at proper use on the physical resource is positive; the total cumulative effects on vegetation resource would generally be reduced.

Under Alternative 2 (No Action), most of the other management actions and uses that currently occur on the Carson Ranger District would continue resulting in impacts vegetative resources. No additional grazing impacts would be incurred; therefore, resource conditions would remain stable or improve at a faster rate. The total cumulative effects on vegetation resources would be reduced.

3.2.1.5. Noxious Weeds and Invasive Species

Livestock can selectively forage on desired species, transport seeds from undesired species, and cause disturbance to soils and microbiotic crusts creating conducive conditions for noxious and invasive weeds to occur. By selectively foraging on desired plants, livestock can give noxious and invasive weeds a competitive advantage over desired plants (Belsky and Gelbard 2000). Mapped acres of noxious weeds in the active allotments are relatively small (less than three acres) with the exception of bull thistle in the Campbell-Loope Allotment (see table 14). As mentioned earlier bull thistle populations expanded following the 2015 Washington Fire as did cheatgrass, particularly on the south facing slopes. As part of the planning process for this project, a Noxious Weed Risk Assessment was conducted consistent with Forest Service Manual 2081.02 and the Sierra Nevada Forest Plan Amendment, to evaluate the potential for noxious and invasive weeds to be introduced and/or expanded in the project area (located in the Project Record and summarized in the Vegetation Specialist Report).

Table 14: Mapped acres of noxious weeds by allotment in the Leviathan Loope Rangeland Project area (includes infestations along the highway on Monitor Pass where sheep do not graze).

Allotment	Hoary Cress (Acres)	Perennial Pepperweed (Acres)	Canada Thistle (Acres)	Scotch Thistle (Acres)	Bull Thistle (Acres)	Musk Thistle (Acres)	Spotted Knapweed (Acres)	Diffuse Knapweed (Acres)	Grand Total (Acres)
Leviathan	.0003	0	.0975	1.9522	0	0	0	0	2.05
Campbell-Loope	0	0	.7335	2.4093	42.7294	.0043	.0985	1.0341	47.0091
Mud Lake	0	47.7531	36.1965	0	29.3213	0	0	0	113.2709
Double Springs	0	0	0	0	.215	0	0	0	.215
Barber	0	0	0	0	0	0	0	0	0

Alternative 1: Proposed Action

According to the noxious weed risk assessment, the Proposed Action has a low to moderate risk for introducing or enhancing new or existing weed populations. This is largely due to the presence of weeds in the project area which are located in areas where sheep could potentially graze. Also factored into the rating was the expansion of noxious and invasive weeds that occurred following the disturbance from the Washington and Slinkard wildfires. Under the Proposed Action, the proper use criteria will promote the growth of desired plant species and reduction of bare ground which will result in more resilient plant communities that are better able to outcompete non-native weeds (Anderson and Inouye 2001). Design features such as modifying grazing strategies to avoid grazing in currently infested areas, as well as requiring a early detection rapid response strategy for new infestations, will minimize the risk of spreading noxious weeds. Additionally, the risk of weed expansion is minimized by the active and aggressive Noxious Weed Program on the Carson Ranger District where weeds are mapped and treated annually on the District, including in the project area. Design features and specific weed management needs will be incorporated into Allotment Management Plans as well as all other permit administration.

Alternative 2: No Action/No Grazing

With the removal of grazing there would be a reduced risk of noxious weeds expanding in the project area as sheep would no longer have the potential to inadvertently transport noxious weed seeds into the project area. Although the removal of livestock would reduce the risk of weed invasion, it does not necessarily inoculate a site against cheatgrass, and another weed invasions. Other factors such as wildlife, anthropogenic disturbance, and natural disturbances (wildfire) can transport and promote noxious and invasive weed infestations. A variety of studies and observations by Davies and others (2009), suggest that a moderate amount of disturbance, including light to moderate grazing, can help build site resistance to invasive plants.

Vegetation Findings Summary

Under the Proposed Action, proper use and prescribed changes in timing, frequency and intensity of use will 1) reduce overuse in key areas, 2) result in better distribution and more even use of forage plants, and 3) reduce the frequency of individual plant exposure to trampling and grazing which is beneficial to preferred plant species. Plant species are tolerant to defoliation depending on the timing of grazing. Grazing strategies will vary the timing of plant exposure to grazing each year. Thus, species favored one year may be less favored in another year. This will result in the recruitment and persistence of desired forage species, maintaining species diversity and productivity and reducing bare ground. The use of a 24-hour herder will further reduce impacts as sheep will be strategically moved throughout the allotment. Forage utilization standards and guidelines will move vegetation groups towards desired conditions for riparian/meadow/stream, upland and aspen resources.

Under the No Action (No Grazing) alternative, vegetation communities that are functional would be maintained, and the remaining ecological communities would continue to improve over time with more desirable herbaceous species in the understory. Bare ground would be reduced due to the retained vegetation cover from the lack of livestock grazing. Plant vigor and reproduction would improve as climate and soil potential allow. Over time, this alternative would result in the increase of litter and plant cover. However, in the absence of grazing, the accumulation of litter and dense vegetation may limit production of herbaceous species and lead to increased fuel loads in some areas.

3.2.2 Range Administration

The Range Management Specialist Report (incorporated by reference) evaluated the impacts of the Proposed Action and No Action Alternative to livestock operations and the Carson Ranger District Range Program. The indicators displayed in Table 15 and in the descriptive text below were used in the analysis to evaluate effects to Range Management and the change from the existing condition for each of the alternatives.

Table 15. Effects to range management activities under the Proposed Action for the Leviathan-Loope Rangeland Management Project.

Indicator	Proposed Action: Alternative 1	No Action: Alternative 2
Changes to allotment boundaries	No effect: The allotment boundary will be adjusted to exclude areas that are largely inaccessible to livestock and have low forage capability. The adjustment will reduce the allotment size from 17,846 to 15,093 acres. Due to the lack of inaccessibility and forage, the adjustment will have no effect on grazing operations.	No effect: Livestock would be removed from the allotments and the Campbell-Loope Allotment boundary would not be changed.
Changes to allotment status	No effect: The closure of Mud Lake, Barber and Double Springs allotments will have no effect on range management in the project area or range management on the Carson Ranger District	No effect: Allotments would remain vacant and continue to have no effect on range management.
Changes to infrastructure: water improvements and fencelines	Beneficial effect: Water improvements will allow livestock to graze more broadly across the allotments resulting in improved vegetation conditions and increased forage capability.	No effect: Existing improvements that are in disrepair would be removed in the future as time and budgets allow.
Changes to timing, duration, or frequency of authorized use, and proper use criteria	Beneficial Effect: Expanded season of use will provide increased flexibility for range managers and permittees to meet range objectives	No effect: Eliminates grazing on all allotments within the Leviathan-Loope Rangeland Project area

3.2.2.1 Changes to Allotment Boundaries

Alternative 1: Proposed Action: The Proposed Action would continue to authorize grazing on the Leviathan and Campbell-Loope Allotments. The Campbell-Loope Allotment boundary would be redefined to exclude areas that are largely inaccessible to livestock, contain only small, non-contiguous patches of forage, and areas that have not been grazed in several decades. The overall boundary adjustment will result in reducing the Campbell-Loope Allotment from approximately 17,846 acres to approximately 15,093 acres (2,753 acres). The adjustment reflects what the ongoing use has been on the allotment for several decades and will therefore have no effect on livestock management for the Campbell Loope Allotment.

Alternative 2: No Action/No Grazing: Under the No Action alternative, the Campbell-Loope Allotment boundary would not be changed as grazing would be discontinued on all five allotments within the Leviathan-Loope Rangeland Project area and allotments would be in vacant status. This would result in a reduction of 31,180 acres available for livestock grazing. Impacts to private land and potentially other Federal grazing allotments may increase due to the elimination of grazing on two active sheep allotments.

3.2.2.2 Changes to Allotment Status

Alternative 1: Proposed Action: Under the Proposed Action, the Mud Lake, Double Springs and Barber C&H Allotments would be closed to livestock grazing. The Mud Lake, Double Springs, and Barber Allotments are small, vacant allotments with low forage capability and are surrounded by either private or other agency lands which are not part of an active or feasible grazing system (see Table 1). Since these allotments have been in Forest Service ownership, only the Barber Allotment was permitted for grazing and that was many decades ago. A Decision Notice signed in 1980 determined the allotment would be closed for wildlife management values once the permittee was no longer interested in owning the permit. The grazing permit was waived back to the Forest Service in 1996. It is unclear why the allotment was not closed at this time. The Mud Lake Allotment also contains valuable habitat for wildlife that exceed the potential grazing benefits. The Forest Service is actively engaged in restoring the wetland habitat which is being threatened by noxious weed infestations. Because these allotments are not

considered to be sustainable for livestock grazing, closure of these allotments will have no effect on the overall grazing management strategy for the Carson Ranger District.

Alternative 2: No Action/No Grazing: Under the No Action alternative, the three allotments would continue to be in vacant status. The Leviathan and Campbell-Loope Allotments would also become vacant. This alternative would result in 31,180 acres available for livestock grazing.

3.2.2.3. Changes to Water Developments and Infrastructure

Alternative 1: Proposed Action: Under the Proposed Action, water improvements would be maintained and improved with the addition of three new improvements to provide for better livestock distribution and overall use of the allotments. Increased dispersal of livestock will contribute to improved range conditions throughout the allotment by allowing previously high use areas to recover and encourage grazing in underutilized areas where decadent vegetation can benefit from light disturbance. Additional maintenance associated with infrastructure may increase; however, incorporating multiple watering locations throughout the allotments will have a positive effect on the overall improvement of rangeland health and improve the flexibility in the management of the allotments.

Under the Proposed Action, existing fences will be removed as time and budgets allow. Boundary fences between the Cottonwood and Campbell-Loope Allotments were constructed to prevent cattle from drifting onto the Campbell-Loope Allotment. These fences are in poor condition due to age and recent wildfires in the area. Since cattle no longer graze the Cottonwood Allotment, fences are no longer required (sheep are contained to areas by herders rather than fences).

Alternative 2: No Action/No Grazing: Under the No Action alternative, no new water developments would be constructed and existing water improvements as well as fences that are in disrepair would be removed in the future as time and budgets allow.

3.2.2.4. Changes to Management Strategy

Alternative 1: Proposed Action: Under the Proposed Action the permitted season of use would be extended May 15th through October 31 to provide for more management flexibility and allow livestock to graze earlier in the season when conditions are appropriate such as predicted drought years. However, the actual grazing season would be determined annually based on range readiness conditions (i.e. weather, soil, vegetation) and within-season utilization monitoring. The earlier on-date will also allow for flexibility in meeting strategic management goals such as using sheep to control cheatgrass infestations. Grazing during spring when cheatgrass is palatable to sheep can help reduce infestations by limiting seed production. Extending the ending dates will provide flexibility when range conditions are not ready until much later in the season due to heavy and sustained snow years. The typical grazing season for both allotments will continue to average one to two months, and the grazing permits will include a variable use clause not to exceed permitted head months and/or maximum days grazed. Maximum number of head months would only be authorized when vegetation communities are in satisfactory and late seral ecological condition.

In the short term, a deferred rotation strategy will be used for both allotments until infrastructure can be completed and rest may be incorporated into the strategy. Periodic rest (as currently used) will continue when necessary. These types of grazing systems allow for the most efficient and non-impactive use as the timing of grazing is matched with the kind of plant community in consideration of long-term objectives. Grazing permittees currently adjust their operations and grazing strategies (authorized in the Annual Operating Instructions) to respond to climate, disturbance (fire), herd sizes, etc.

Alternative 2: No Action/No Grazing: Under Alternative 1 (No Action) alternative livestock grazing on the Leviathan and Campbell-Loope Allotments would no longer be authorized, eliminating 7,454 head months of domestic livestock grazing in Douglas County, NV and Alpine County, CA. Impacts to private land and potentially other Federal grazing allotments may increase as a result of the reduction in grazing opportunity.

Cumulative Effects to Range Administration

Under Alternative 1 (Proposed Action), other activities that currently occur in the project area, such as OHV use and dispersed camping would continue resulting in impacts on vegetative resources in some areas. Where livestock grazing overlaps with these areas, impacts to vegetation could be greater. However, under the proposed action, the proper use criteria combined with improved and increased herd management will reduce the overall impacts to vegetation and allow resource conditions to trend upward by increasing productivity and vigor of individual plants and decreasing the amount of bare ground.

Under Alternative 2 (No Action), most of the other management actions and uses that currently occur on the Carson Ranger District would continue resulting in impacts to vegetative resources. No additional grazing impacts would be incurred; therefore, therefore, resource conditions would remain stable or improve at a faster rate. The total cumulative effects on vegetation resources would be reduced

3.2.3. Cultural Resources

The authorization of livestock grazing, including management practices and range improvements, has the potential to affect cultural resources. In general, actions which effect vegetation, soil stability, erosion, and ground cover can be said to impact cultural resources. Common effects from grazing include trampling, artifact breakage, soil compaction, destabilization of stream banks, and increased erosion due to reduced ground cover. These effects may impact recorded sites and sites that have not yet been discovered and recorded. As such, the *Cultural Resource Report for the Leviathan-Loope Range Rescission Project (R2014041702413)* addresses the potential effects to cultural resources from the authorization of livestock grazing. Cultural resources in the project area are being managed in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA).

Analysis Area: The analysis area for direct, indirect, and cumulative effects for this Environmental Assessment is the boundaries of the two allotments where the proposed action is to reauthorize grazing (Leviathan and Campbell-Loope). The three allotments that the Forest Service proposes to close under Alternative 1 were not analyzed in detail from a cultural resource perspective since it is not considered an undertaking that has the potential to have adverse effects to cultural resources (36 CFR 800.3 (a)(1)). Barber Allotment is the only allotment of the three that was ever permitted for grazing and has not been grazed since the early 1990s. There would be no direct, indirect or cumulative effects from the decision to close these vacant allotments.

Analysis: Range improvements where livestock congregate (e.g., troughs, reservoirs, bedding areas, etc.) were mapped and a Class II pedestrian inventory was completed on approximately 819 acres. A total of 35 sites were recorded, four sites were updated with new information, two sites were monitored for adequacy, and two sites were unable to be relocated during field inventory. Some existing range developments (watering and bedding sites) have been placed too close to archaeological sites. The cultural resource report outlines actions that must be taken to avoid or minimize adverse effects to individual sites. The general management requirements identified in Table 16 will ensure detailed requirements for each site are executed.

Table 16. Standard Management Requirements for the Action Alternative (Alternatives 1)

Area of Concern	Management Requirement Designed to Prevent Undesirable Effect	Responsible Persons
Cultural Resources	The AOI shall be reviewed to determine if additional cultural resource inventory is needed, and to ensure that cultural resource concerns are conveyed.	Range Management Specialist, Cultural Resources Specialist
Cultural Resources	If adverse effects to sites eligible or potentially eligible for inclusion in the National Register of Historic Places are identified in the future, additional protection measures will be required to prevent additional impacts.	Range Management Specialist, Cultural Resources Specialist

Alternative 1: Proposed Action

Alternative 1 (Proposed Action) would manage livestock grazing in a manner that is more favorable to the protection and preservation of cultural resources. Lower utilization levels proposed would result in improved vegetation conditions, reduced soil erosion, trampling and compaction, and improved stream bank stability. These vegetation improvements would be most evident around springs, meadows and other riparian areas, which are also areas of high concentrations of cultural sites. Furthermore, the planned grazing levels of sheep are far below historic use of the area. With these improved conditions, cultural sites should be less exposed, which should reduce artifact breakage and improve concealment. Conditions under the proposed action would make cultural sites less vulnerable to looting and illegal collection. Potential cumulative effects would primarily consist of historic and continued grazing operations that removed ground cover and increased the visibility of cultural resources exposing them to looting and vandalism. This potential is influenced by the stocking rate and season of use. The proposed action would change the overall distribution of livestock by increasing the number of water sources and limiting browsing intensity in other locations, resulting in long-term reductions in the potential for effects to cultural resources.

Alternative 2: No Action/No Grazing

Under Alternative 2 (no action/no grazing), grazing would be precluded in all five allotments. There would be no potential for direct effects to cultural resources resulting from livestock grazing. Under the No Action alternative ground cover would remain intact reducing the potential for looting or other adverse effects to cultural resources. Effects from past grazing practices would continue until vegetation conditions recover and limit the exposure of cultural sites to erosion and looting.

3.2.4. Biological Resources

This section summarizes effects analysis for biological resources including Biological Evaluations and Assessment for Terrestrial Wildlife, Botany, and Fisheries.

Biological Assessments and Evaluations

All Federally listed species and Forest Sensitive Species (RFSS) were considered for analysis in the Biological Assessments and Evaluations for wildlife, botany, and aquatic resources (Tables 17 and 18). Only those species with suitable habitat and at least a marginal potential of occurrence within the project area were considered for analysis. This section includes effects determinations for each species by alternative and provides detailed summary information related to the proposed action.

Table 17. Description of effects determinations for Threatened, Endangered, and USDA Forest Intermountain Region Forest Sensitive Species (Forest Service Manual 2670 including Supplement No: R2_2600-2011-1)

Effects Determination	Description
Federally Listed Threatened or Endangered Species	
No Effect	*Project will have no effect on T&E species*
May affect but not likely to adversely affect	*Effects are expected to be beneficial, insignificant (unmeasurable), or discountable (extremely unlikely).*
May affect and is likely to adversely affect	*Listed species are likely to be exposed to the action or its environmental consequences and will respond in a negative manner to the exposure*
Forest Sensitive Species	
No Impact	*Project will have no impact on Forest Sensitive species*
May impact individuals, but will not result in a loss of viability, nor cause a trend toward federal listing	*Project may have minor impacts on individual sensitive species but will not result in long term adverse impacts to a population*
Likely to result in a loss of viability or lead to a trend toward federal listing.	*Project will result in significant impacts to the viability of a population*

Table 18: Summary of potential effects on special status species that may occur within the Leviathan-Loope Rangeland Management Project area. Species analyzed include U.S. Fish and Wildlife Service Federally listed Threatened, Endangered, Proposed and Candidate species and Forest Service Sensitive species.

Species	Status	Present in Project Area: Habitat and/or Occurrences	Effects Determination Alternative 1-Proposed Action	Effects Determination Alternative 2-No Grazing
FISHERIES AND AQUATICS				
Yosemite Toad (*Anaxyrus canorus)*	USFWS Threatened	No	**No effect.** No occupied or designated critical habitat in the project area. See Biological Assessment	**No effect**
Sierra Nevada Yellow-Legged Frog (*Rana sierrae*)	USFWS Endangered	No	**No effect.** No occupied or designated critical habitat in the project area. See Biological Assessment	**No effect**
Lahontan Cutthroat Trout *(Oncorhynchus clarkii henshawi)*	USFWS Threatened	Yes	**May affect not likely to adversely affect**. Sheep cross occupied habitat (East Carson River). See Biological Assessment	**No effect**
Paiute Cutthroat Trout (*Oncorhynchus clarkii seleniris*)	USFWS Threatened	No	**No effect**. No occupied habitat within the project area.	**No effect**
WILDLIFE				
Sierra Nevada Bighorn Sheep (*Ovis canadensis sierrae*)	USFWS Endangered	No	**No effect.** No occupied or designated critical habitat in the project area. See Biological Assessment comments.	**No effect**
Northern Goshawk (*Accipiter gentilis*)	USFS R4 Sensitive (HTNF)	Yes	**No impact.** Minimal overlap with goshawk habitat; no conflicts with nesting or foraging activities. See Biological Evaluation comments.	**No impact**
Bald Eagle (*Haliaeetus leucocephalus*)	USFS R4 Sensitive (HTNF)	Yes	**No impact.** Nest located approximately 1 mile from project. No overlap of habitat between grazing and bald eagle nesting and foraging. See Biological Evaluation comments.	**No impact**
Peregrine Falcon (*Falco peregrinus anatum*)	USFS R4 Sensitive (HTNF)	Yes	**No impact.** No overlap of habitat between grazing and peregrine nesting and foraging**.** See Biological Evaluation comments	**No impact**
Mountain Quail (*Oerortyx pictus*)	USFS R4 Sensitive (HTNF)	Yes	**May impact but will not lead to a trend toward federal listing or affect the viability of the population.** See Biological Evaluation and summary below.	**No impact**
Greater Sage Grouse Bi-State Distinct Population Segment (DPS) (*Centrocercus urophasianus*)	USFS R4 Sensitive (HTNF) USFWS Proposed HTNF MIS	Yes	**May impact but will not lead to a trend toward federal listing or affect the viability of the population.** See Biological Evaluation and summary below.	**No impact**

Species	Status	Present in Project Area: Habitat and/or Occurrences	Effects Determination Alternative 1-Proposed Action	Effects Determination Alternative 2-No Grazing
Great Gray Owl (*Strix nebulosa*)	USFS R4 Sensitive (TNF)	No	**No impact**; No suitable habitat and no known occurrences. See Biological Evaluation	**No impact**
California Spotted Owl (*Strix occidentalis occidentalis*)	USFS R4 Sensitive (HTNF)	Yes	**No impact**; Only marginal available habitat; no known occurrences. See Biological Evaluation/Biological Assessment comments	**No impact**
Flammulated Owl (*Otus flammeoulus*)	USFS R4 Sensitive (HTNF)	Yes	**No impact**. Minimal overlap with flammulated owl habitat; no conflicts with nesting or foraging activities. See Biological Evaluation	**No impact**
White-Headed Woodpecker (*Picoides alborlarvatus*)	USFS R4 Sensitive (HTNF)	Yes	**No impact.** Minimal overlap with white-headed woodpecker habitat; no conflicts with nesting or foraging activities. See Biological Evaluation	**No impact**
Bighorn Sheep (*Ovis Canadensis spp.*)	USFS R4 Sensitive (HTNF)	No	**No impact.** No suitable habitat and no herd units within 50 miles. See Biological Evaluation.	**No impact**
Pygmy Rabbit (*Brachylagus idahoensis*)	USFS R4 Sensitive (HTNF)	No	**No impact.** No suitable habitat-soil type not conducive to pygmy rabbits; not within known or historic distribution. See Biological Evaluation.	**No impact**
Spotted Bat (*Euderma maculatum*)	USFS R4 Sensitive (HTNF)	Yes	**No impact.** Suitable habitat near East Carson River. No known occurrences. No conflict with grazing and bat roosting or foraging habitat. See Biological Evaluation	**No impact**
Townsend's Big-Eared Bat (*Corynorhinus townsendii*)	USFS R4 Sensitive (HTNF)	Yes	**No impact.** Known to roost in mine shaft near Campbell-Loope Allotment. No conflict with grazing and bat roosting or foraging habitat. See Biological Evaluation	**No impact**
North American Wolverine (*Gulo luteus*)	USFS R4 Sensitive (HTNF) USFWS Proposed	No	**No impact.** Not known to occur on the Carson Ranger District or in the Sierra Nevada range. See Biological Assessment	**No impact**
Sierra Nevada Red Fox (*Vulpes necator*)	USFS R4 Sensitive (HTNF) USFWS Candidate	No	**No impact.** Project area is well below elevation of known distribution of SNRF. Nearest detection is 14 miles south. No conflict between sheep grazing and use of habitat by SNRF. See Biological Evaluation.	**No impact**
BOTANICAL (Rare Plants)				
Lavin's Milkvetch *Astragalus oophorus* var. *lavinii*	USFS R4 Sensitive (HTNF)	Potential to occur Project Area	May impact individuals of Lavin's milkvetch, but will not lead to a trend toward Federal listing or loss of viability of this species.	**No impact**
Upswept Moonwort *Botrychium ascendens*	USFS R4 Sensitive (HTNF)	Potential to occur Project Area	May impact individuals but will not lead to a trend toward Federal listing or loss of viability of this species.	**No impact**

Species	Status	Present in Project Area: Habitat and/or Occurrences	Effects Determination Alternative 1-Proposed Action	Effects Determination Alternative 2-No Grazing
Dainty moonwort *Botrychium crenulatum*	USFS R4 Sensitive (HTNF)	Potential to occur Project Area	May impact individuals but will not lead to a trend toward Federal listing or loss of viability of this species.	**No impact**
Slender moonwort *Botrychium lineare*	USFS R4 Sensitive (HTNF)	Potential to occur Project Area	May impact individuals but will not lead to a trend toward Federal listing or loss of viability of this species.	**No impact**
Three-ranked hump-moss *Meesia triquetra*	USFS R4 Sensitive (HTNF)	Potential to Occur Project Area	May impact individuals but will not lead to a trend toward Federal listing or loss of viability of this species.	**No impact**
Shevock's bristle-moss *Orthotrichum shevockii*	USFS R4 Sensitive (HTNF)	Potential to Occur Project Area	May impact individuals but will not lead to a trend toward Federal listing or loss of viability of this species.	**No impact**

3.2.4.1. Fisheries and Amphibians

Summary of Determinations

Lahontan Cutthroat trout (LCT) occur within the project area within the East Carson River which is in the Western Lahontan Basin Geographic Management Unit (GMU) for LCT. However, this portion of the East Carson River contains primarily LCT that are stocked for recreational fisheries and does not contain any recovery populations of LCT. The Project Lahontan Cutthroat trout (LCT) Biological Assessment (BA) found that LCT historically occurred throughout the East Fork Carson River watershed; however, they have been largely displaced by non-native salmonids (USFWS 2009). Currently, the only known LCT population that occurs within the project area is in the East Fork Carson River, which occurs due to stocking by the California Department of Fish and Wildlife.

Alternative 1: Proposed Action

Grazing along the East Fork Carson River does not currently or potentially occur under the Proposed Action. The only effect from the Proposed Action is from trailing sheep (1,650 ewes) across the East Fork Carson River within the Campbell-Loope Allotment. Once the sheep cross the river they are moved into other portions of the allotment away from occupied habitat. Sheep tend to cross rivers/streams in very shallow areas which trout are unlikely to inhabit and only use to access preferred habitat; therefore, the likelihood of individual LCT occurring in the vicinity when sheep are crossing the East Fork Carson River is low. In addition, any disturbance from the river crossing will not permanently alter river/riparian habitat. This activity will occur twice per year, will be short in duration (3 hours) at each crossing event, and will occur outside of spawning season. Any sediment plume from the sheep will be short in duration and does not present a long-term chronic sediment source, only a pulse disturbance. Any LCT located downstream of the crossing will be able to move out of the area and then return as there are no obstructions to movement. For these reasons, only insignificant effects on LCT or their habitat are expected. The Proposed Action may affect but is not likely to adversely affect LCT.

Cumulative Effects: Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Recreational fishing for LCT can affect both abundance and age class distribution of the population and deplete age class structure during periods of low abundance, which may delay recovery of population levels. Introductions of nonnative fish species are also frequently attributed to use of live bait for fishing and unauthorized introductions of nonnative gamefish species in conjunction with recreational fishing activities. However, the Leviathan Loop

Rangeland project will have only minor effects on LCT and therefore will not contribute to additional affects from recreation activities. The Report found that under Alternative 2 (No Action) there will be no direct or indirect effects to LCT.

Alternative 2: No Action/No grazing

Under the No Action alternative there will be no effects to Lahontan cutthroat trout. Because the current actions of livestock grazing in the project area result in only minor and temporary impacts to LCT, the removal of grazing will have no measurable effect on LCT or their habitat.

3.2.4.2. Sensitive Species-*Wildlife*

Summary of Determinations

As shown in Table 18, the following Forest Sensitive species have potential habitat within the project area but will not be impacted from the proposed project: *northern goshawk, flammulated owl, California spotted owl, bald eagle, peregrine falcon, white-headed woodpecker, Townsend's big-eared bat,* and *spotted bat*. Habitat for these species does not overlap with the vegetation types that sheep primarily graze and therefore the potential for disturbance to nesting and/or foraging wildlife species will be negligible. Sheep graze primarily in open brush communities and are required to bed only in designated areas which do not include aspen and conifer stands. She will graze the periphery of aspen stands but typically avoid the interior of these stands due to the multi-canopied dense understory (including downed logs) that make it difficult and unappealing for sheep to navigate through.

Under the No Action Alternative there will also be no impact to the above species. Because the current actions of livestock grazing in the project area are assumed to result in negligible impacts to these species, the removal of grazing will have no measurable effect on individual species or their habitat.

The following species are known to occur and/or have habitat in the project area and are associated with habitat types that overlap with grazing activities: *Bi-state sage grouse* and *mountain quail.* The Leviathan-Loope Rangeland project may result in impacts to these species but will not result in a loss of viability or a trend toward federal listing.

Bi-State Sage Grouse

Alternative 1: Proposed Action

The greater sage grouse bi-state Distinct Population Segment (DPS) population was proposed for listing as threatened by the U.S. Fish and Wildlife Service (USFWS) in October 2013. A rule to delineate proposed critical habitat was also issued at this time. The bi-state sage grouse is also designated as a Region 4 Forest Service sensitive species. The state wildlife agencies from Nevada and California have identified six Population Management Units (PMUs) to describe occupied habitat within the Bi-state area (Bi-state Plan 2012). According to the Conservation Plan, only the Pine Nut PMU is within or adjacent to the project area. The Pine Nut PMU totals approximately 574,000 acres, of which approximately 20,467 acres (or 4%) overlaps with the Leviathan-Loope project area (Bi-state Plan 2012). The project area contains approximately 16,204 acres of proposed critical habitat for the bi-state sage grouse and accounts for approximately 6 % of the Pine Nut proposed critical habitat unit.

Habitat for sage grouse in the project area does not contain any leks, nesting areas, or brooding habitat. Sage grouse are only known to occur on the Leviathan Allotment primarily by individual males in the late summer as they disperse away from breeding grounds. In general, livestock grazing can have negative or positive impacts on sage grouse habitat depending on the timing and intensity of grazing (Crawford et al. 2004). Under the proposed action, the proper use criteria including standards and guidelines from the Sierra Nevada Forest Plan and the Bi-State Sage Grouse Forest Plan Amendments will improve understory grass, forb, and shrub cover and maintain

sufficient vegetation to provide for late summer dispersal habitat for bi-state sage grouse (see table 6). Under the proposed action, new water developments and improvements to existing water developments will be made throughout the analysis area. The current lack of available water has resulted in limited livestock distribution. The proposed improvements to current watering sites as well as the new developments are designed intentionally to not only improve access to water, but also to move sheep more evenly around the allotment which will allow vegetation in currently impacted areas to recover. In accordance with Standard RI-S-06 from the Bi-State Sage Grouse Forest Plan Amendment, water troughs and tanks will be placed away from riparian areas (including meadows seeps and springs) and will be placed in upland, xeric landscapes thereby having minimal impact on sage grouse habitat. Water developments may also benefit sage grouse and other wildlife by providing increased access to water particularly in areas where water is currently scarce. Under the Proposed Action, all water developments will be drained at the end of the season to prevent breeding grounds for mosquitos carrying West Nile virus and will be fitted with escape ramps to minimize the potential for inadvertent drownings of wildlife and (Standard RI-03, 04). Escape ramps will be designed to meet NRCS and Bat Conservation International Standards (Taylor and Tuttle 2007). The increased number of functioning water developments would result in livestock being present in any location on the allotment for a shorter time period, which would lead to fewer sage grouse/sheep encounters and less disturbance to habitat.

Under the proposed action, the season of use for sheep grazing for both allotments will be expanded to include the potential for earlier on dates and later off dates than what is currently permitted (see table 1). As mentioned earlier, the Leviathan allotment has higher quality habitat for sage grouse compared to the Campbell-Loope Allotment, although neither allotment contains any breeding, lekking, or brood rearing habitats. The inclusion of an earlier on date for livestock will result in no increased direct or negative indirect impacts to sage grouse as sage grouse typically do not occur in the area until mid to late August and even then, are considered only transitory. Proper use criteria, design features and proposed water improvements will result in habitat conditions that will be maintained as functioning and/or moved toward more functioning condition.

Mountain Quail

Alternative 1: Proposed Action

Mountain quail are native to the Carson Range (GBBO 2010) and have been observed in several locations on the Carson Ranger District; however, actual distribution of mountain quail within the analysis area is not known. It is assumed that mountain quail are more likely to occur on the Campbell-Loope Allotment due to the abundance of conifer and shrub communities compared to the Leviathan Allotment (see Vegetation Specialist Report). In some portions of the analysis area, the timing of grazing may overlap with the nesting season for mountain quail. Under the Proposed Action, concentrated use areas for sheep would include already disturbed sites such as roads and open rocky areas and would not be located near densely brushed areas or riparian areas where mountain quail would likely nest. The majority of capable acres for grazing within the analysis area are considered to be functioning at risk with an upward trend (See Vegetation Specialist Report-project record). Under the Proposed Action, utilization standards and other proper use criteria are designed to improve the ecological function of all plant community types including riparian and upland shrub. For example, allowable riparian vegetation utilization and streambank disturbance is set at 20% which allows for some minor disturbance associated with livestock grazing, crossing and watering but will not contribute to erosion, compaction, or other riparian vegetation degradation.

Expected changes to quality of habitat under the Proposed Action (bi-state sage grouse and mountain quail):

Important habitat areas for bi-state sage grouse and mountain quail such as riparian and shrub communities are currently functioning to functioning-at-risk within both allotments. Under the Proposed Action, conditions are expected to continue to improve and will not fall within the non-functioning category for any vegetation group. New water structure placements, as well as rest rotation grazing strategy will help redistribute livestock across the allotments and minimize the potential for compaction and over utilization.

Sage grouse and mountain quail habitat has the potential to be affected by changes in climate which can then be exacerbated by the impacts of livestock grazing. Recent extremes in weather conditions such as prolonged drought, rising temperatures and more intense dry seasons have resulted in undesirable changes in vegetation composition as well as more extreme and frequent wildfires (CalFire 2019). These factors are expected to continue and increase in coming years (Cal Fire 2019, USEPA 2016). Under the Proposed Action, an annual adaptive management approach will be employed to respond not only to the direct impacts of livestock grazing but also the changing environmental conditions that can affect the ecological condition of vegetation in the allotments. Short term and long-term monitoring information will be used to inform managers on existing range conditions as well as overall ecological trends and what changes in range management need to be made to align with those trends. In addition, relying on resources such as the National Weather Service drought models (https://www.cpc.ncep.noaa.gov/products/Drought/) will also allow range managers to prepare permittees for modifications to the upcoming grazing season that will be necessary to adapt to environmental conditions.

Cumulative Effects

Bi-State sage grouse: The cumulative impacts analysis for bi-state sage grouse focused primarily on the highest risk factors for sage grouse in the Pine Nut Population Management Unit (PMU) (Bi-State Conservation Plan 2012). According to this plan, the highest risks include wildfire; pinyon-juniper encroachment into sagebrush communities; habitat type conversion to cheatgrass; human disturbance (OHV); infrastructure (roads and fences); and energy development (wind). Predation and wild horse grazing are considered "Moderate" risks, and permitted livestock grazing and wind energy testing are listed as "low risk" to sage grouse within this PMU.

Wildfire has burned thousands of acres of sage grouse habitat within the Pine Nut PMU, including important nesting habitat near the Mill Canyon Dry Lake Lek site which was burned during the 2007 Adrian Fire and is outside of the project area. Within the project area, summer habitat for sage grouse was affected by the 2015 Washington fire and the 2017 Slinkard Fire. Cheatgrass and other invasives are present in some of these burned areas; however, post fire restoration efforts, such as seeding and active weed management, as well as passive vegetation recovery have helped with native plant restoration. Under the Proposed Action, livestock grazing will not contribute to an increase in fuel loading from plant community conversions (i.e. to invasive). Vegetation communities will either be maintained or moved toward a more functioning ecological condition which will allow for continued natural resiliency to high intensity wildfires.

The Monitor Pass Habitat Improvement Project recently resulted in over 3000 acres of sage grouse habitat being improved by the removal of encroaching pinyon juniper habitat. Several miles of fence lines have been removed in the Leviathan Allotment and neighboring Cottonwood Allotments over the past decade, reducing the risk of mortality to sage grouse from collisions. Additional fences will be removed in both Leviathan and Campbell-Loope allotment as time and funding allows. No wind energy facilities are proposed in or near the East Alpine Rangeland project area. However, a communications facility at Leviathan Peak is proposed to replace an existing tower in the next two years. This project is not located near leks, nest sites, or brood rearing habitat and therefore will have minimal effects on sage grouse.

Mountain quail: Cumulative impacts to mountain quail from the proposed action will be minimal. The Monitor Pass Habitat Improvement project, in addition to implementation of the proper use criteria under the Proposed Action, will contribute to improving habitat conditions for mountain quail over the long term, particularly in riparian areas that contain a robust understory of aspen seedlings and other mountain shrubs. The Monitor Pass Habitat Improvement project would also reduce the threat of a high intensity wildfire and subsequent loss of habitat for mountain quail. Disturbance from both projects will be minimal and short term and not lead to any long-term negative effects to mountain quail.

Alternative 2: No Action/No Grazing (bi-state sage grouse and mountain quail)

Under the No Action alternative grazing would immediately cease within the project area. Direct and indirect impacts to sage grouse and mountain quail from grazing would no longer occur on either of the allotments. Livestock congregation areas would be eliminated in potential habitat and in these areas plant vigor, soil stability,

and ground cover may increase. Composition and density of plant species would move toward desirable conditions. Sage grouse and mountain quail could be positively impacted by the reduction in structural damage to brush species from livestock grazing.

Under the No Action alternative, riparian areas, uplands, meadows, seeps, and springs would recover at a faster pace than the action alternative, potentially benefitting sage grouse and mountain quail. Livestock would no longer have the potential to displace sage grouse and mountain quail to other habitats. Sage grouse and Mountain quail habitat that is functioning at risk is expected to improve under the No Action alternative at a faster rate than the action alternative. Sage grouse and mountain quail habitat that is in functioning condition would remain stable.

Expected changes to quality of habitat under the No Action Alternative (bi-state sage grouse and mountain quail):

Compared to the Proposed Action, the No Action alternative would have no measurable increased or decreased impacts on sage grouse or mountain quail habitat. While habitat conditions would be expected to improve under the No Action alternative, design features, improved grazing strategies, and the incorporation of Forest Plan standards and guidelines under the Proposed Action will also result in improved habitat conditions in most areas. In addition, because the disturbance from livestock grazing to sage grouse and mountain quail is so infrequent, the removal of grazing activity will not result in any measurable benefits to sage grouse or mountain quail.

3.2.4.3. Sensitive Species-*Botany*

Summary of Determinations

Alternative 1: Proposed Action

Currently, there are no Forest Service Region 4 Sensitive plant species known to occur within the project area (see table 18); however potential habitat for the following six Sensitive plant species was documented in both allotments: Lavin's milkvetch (*Astragalus oophorus* var. lavinii), upswept moonwort (*Botrychium ascendens*), dainty moonwort (*Botrychium crenulatum*), slender moonwort (*Botrychium lineare*), three-ranked hump-moss (*Meesia triquetra*), and Shevock's bristle-moss (*Orthotrichum shevockii)* (see table 18).

The Botany Biological Evaluation/Assessment and Summary Report found that in general, direct or indirect effects may occur when sensitive plants or their potential habitat are physically impacted by activities associated with the Proposed Action. Direct impacts may include herbivory, crushing or breaking plants, burying them under fecal matter, or disturbing or compacting soils in the immediate vicinity of plants. Although no occurrences of rare plants are known from the project area, the presence of habitat for these species and the dynamic nature of plant growth cycles may mean plants could occur in the future. Under the Proposed Action, if rare plants are documented in the project area in the future, plants will need to be flagged and avoided or otherwise protected as determined by the district or forest botanist. Additionally, the Leviathan-Loope Project would include improvements to water developments, rest rotation strategies, incorporation of utilization standards and disturbance thresholds, establishment of proper use criteria and within season triggers, implementation of short and long-term monitoring plans, and development of updated Allotment Management Plans; all of which would be used to direct adaptive management actions when appropriate and protect rare plant habitat. Moreover, the range management standards and guidelines outlined in the Toiyabe LRMP and the SNFPA were developed to protect natural resources while providing for livestock grazing within rangeland areas.

The Botany Specialist Reports concluded that for each of the sensitive species with potential habitat in the Project Area, the Proposed Action may impact individuals, but will not lead to a trend toward Federal listing or loss of viability for these species. The report also concluded there will be no impacts to sensitive plants from the closing

of Mud Lake, Barber, and Double Springs Allotments due to the lack of grazing that has occurred in these allotments and the low potential for TES plant habitat in these areas.

Alternative 2: No Action/No Grazing

There would be no direct effects on TES plant species or their habitat from the No Action alternative, since livestock grazing would not occur on the allotments; thus, potential impacts from trampling, grazing, and burial by livestock would be eliminated

Cumulative Effects: The Botany specialists report evaluated the potential of cumulative effects associated with the Proposed Action resulting from the Washington Fire, California Weed Management Project, and ongoing OHV and dispersed recreation activities. The impacts of these activities are highly dispersed throughout the project area. According to the Botany Biological Evaluation, due to the protection measures associated with the above activities, in addition to the proper use criteria under the proposed action, ongoing actions will only result in minor additional affects(if any) to the six sensitive plant species with potential to occur in the project area.

The Report found that under Alternative 2 (No Action) there will be no direct or indirect effects to sensitive plants or their habitat.

3.2.4.4. **Management Indicator Species and Migratory Birds**

Summary of Determinations

Management Indicator Species

Management indicator species (MIS) are identified in the Toiyabe National Forest Land and Resource Management Plan (USDA 1986) as representing a group of species having similar habitat requirements. A review was conducted to determine: 1) if the project is within the range of any MIS, 2) if habitat is present within the proposed project area, and 3) if there are potential direct, indirect or cumulative effects on habitat components. In the Wildlife Specialist Report, the following habitat component / indicator species were determined to be present in the project area: shrubland (west-slope chaparral types): mule deer and sage grouse; riparian: yellow warbler; river and lacustrine (aquatic): macroinvertebrates and Lahontan cutthroat trout (LCT) (see table 19 below).

Table 19. Toiyabe National Forest Management Indicator Species and Associated Habitats and potential for their occurrence within the Leviathan-Loope Rangeland Management project area.

Habitat or Ecosystem Component	Toiyabe National Forest Management Indicator Species *Scientific Name*	Category for Project Analysis[1]
Riverine & Lacustrine	aquatic macroinvertebrates,	3
	Lahontan cutthroat trout *Oncorhynchus clarkii henshawi*	3 *(Also Threatened- analyzed in BA)*
	Paiute cutthroat trout *Oncorhynchus clarkii seleniris*	1
Shrubland (west-slope chaparral types)	sage grouse *Centrocercus urophasianus*	3 *(Also FS Sensitive spp, analyzed in the BE)*
	mule deer *Odocoileus hemionus*	3
Aspen	Williamsons sapsucker *Sphyrapicus thyroideus*	2
Riparian	yellow warbler *Setophaga petechia*	3
Early, Mid -Seral Coniferous Forest	Yellow-rumped warbler *Setophaga coronata*	2

Habitat or Ecosystem Component	Toiyabe National Forest Management Indicator Species *Scientific Name*	Category for Project Analysis[1]
Late Seral Closed Canopy Coniferous Forest	American marten *Martes americana*	2
	Northern goshawk *Accipiter gentilis*	2 (*also a FS sensitive spp; analyzed in the BE)*
Snags in Green Conifer Forest	Hairy woodpecker *Picoides villosus*	2

[1]**Category 1**: MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.
Category 2: MIS whose habitat is in or adjacent to project area but would not be either directly or indirectly affected by the project.
Category 3: MIS whose habitat could be either directly or indirectly affected by the project

Alternative 1: Proposed Action

Under the Proposed Action, the proper use criteria and design features are designed to provide accelerated restoration and improvement of degraded vegetation communities to a functional condition and to maintain those sites currently in a fully functional condition. Livestock grazing, however, may result in some minor and short-term effects to mule deer, yellow warbler and macroinvertebrates such as temporary displacement and forage competition. However, these impacts are expected to be minimal and would not result in a downward trend of these habitat component / indicator species. Findings regarding the habitat component or specific species effects for sage grouse and LCT are described in the wildlife and aquatics determinations.

Cumulative Effects: The Monitor Pass Habitat Improvement Project has the potential to improve habitat conditions for mule deer, yellow warblers and macroinvertebrates. Mule deer are commonly associated with aspen stands, particularly during fawning and rearing of young. Aspen stands associated with riparian areas provide habitat for yellow warblers, as well as indirectly help improve water quality conditions for macroinvertebrates. Although habitat for mule deer and yellow warblers was lost during the 2015 Washington Fire, post-fire regeneration was highly successful in some areas including large releases of new of new shrubs, forbs and aspen. The fire did not result in any long-term effects to habitat quality for macroinvertebrates.

Alternative 2: No Action/No Grazing

Potential effects from the No Action alternative to MIS were analyzed in the Wildlife Specialist Report (Project Record). Under the No Action/No Grazing alternative habitat conditions for mule deer, yellow warbler and macroinvertebrates would continue to move toward a more functioning condition although possibly at a faster rate than the Proposed Action. Under the No Action alternative disturbance to MIS from livestock grazing would cease to occur. Under the Proposed Action, disturbance from sheep grazing will have only minor short-term effects on MIS; therefore, the removal of grazing would have no measurable effect on the existing trend in habitat conditions and will not alter the current distribution of mule deer, yellow warbler, or macroinvertebrate populations.

Migratory Birds

Executive Order (EO) 13186, signed January 10, 2001, requires federal agencies to protect migratory birds by supporting the conservation intent of the Migratory Bird Treaty Act. Under this Order, Federal agencies must integrate bird conservation principles, measures, and practices, into agency planning and activities. Agencies should also, to the extent practicable, avoid or minimize adverse impacts on migratory bird resources when conducting agency actions. The two largest threats to NTMB are habitat fragmentation on breeding grounds and deforestation of wintering habitat (Finch 1991). Compared to other birds, migratory species are the most negatively affected by fragmentation, and are usually absent from small or highly isolated forests (SERC 2003). The distribution and diversity of birds is highly associated with structural diversity in vegetation.

Alternative 1: Proposed Action

Direct and Indirect Effects: Implementation of Alternative1 will not affect the viability, distribution or conservation status of migratory birds. Because of the inherent disturbance associated with livestock grazing, individual birds will continue to be exposed to some level of disturbance when sheep are in the area. The potential for conflicts between nesting birds and disturbance would be greater during the occasions when livestock begin grazing in May verses June or July. However, earlier on dates for livestock would only happen occasionally as part of a flexible grazing strategy to meet range objectives and therefore impacts to nesting birds would be rare. Under the proposed action sheep will be distributed more broadly and more often thereby reducing the time any one area is impacted from disturbance. It is assumed migratory birds have developed some level of adaption to disturbance from livestock grazing in the area as this activity has occurred here for many decades.

Livestock grazing can also affect the quality of foraging and nesting habitat for many migratory birds, especially those requiring heavy shrub or herbaceous ground cover for nesting and foraging within riparian and upland brush communities. Many of the vegetation communities within the project area are currently functioning-at-risk. Under the Proposed Action, the proper use criteria (end of season utilization levels and streambank disturbance) and other forest plan standards and guidelines under the Proposed Action will continue to improve and or maintain habitat conditions for all vegetation groups. The prescribed utilization levels would leave vegetation intact following grazing and will not reduce the quality or availability of habitat for migratory birds.

Cumulative Effects: The Monitor Pass Aspen Enhancement project will improve habitat conditions for migratory birds over the long term. Healthy aspen stands are often associated with some of the highest diversity of plants and wildlife (including migratory birds) than any other habitat group. Under the Proposed Action for this project, restoration of aspen stands will lead to healthier, more vigorous stands that will improve habitat for a number of migratory bird species. Short term impacts associated with the project may include displacement of migratory birds during project activities. However, the project is designed with a limited operating period (LOP) that will avoid activities during the majority of the breeding season for most migratory birds. The Monitor Pass Aspen project will also reduce the threat of a high intensity wildfire and subsequent loss of habitat for migratory birds.

Alternative 2: No Action/No Grazing

There will be no direct, indirect, or cumulative effects to migratory birds under the No Action Alternative. Compared to the Proposed Action, less disturbance to migratory birds would occur due to the cessation of livestock grazing in the area. Although vegetation conditions will also improve under the Proposed Action, improvements would likely occur at a faster rate under the No Action alternative due to the lack of grazing and other disturbance to soils and vegetation.

3.2.5. **Soil and Water Resources**

The Watershed Resources specialist report evaluated the potential impacts of Alternative 1(Proposed Action) and Alternative 2 (No Action/No Grazing) on watershed, water quality, and soil resources. The indicators displayed in Table 20 and in the descriptive text below were used in the analysis to evaluate change from the existing condition for each of the alternatives.

Table 20: Summary of potential effects on soils, watershed, hydrology and water quality resources that may occur within the Leviathan-Loope Rangeland Management Project area.

Indicator	Alternative 1: Proposed Action	Alternative 2: No Action
Riparian Conditions	The meadow systems in each allotment were determined to be functioning-at-risk. The allowable utilization would be 20% for woody vegetation, such as willow, and 30% for herbaceous vegetation. Streambank disturbance would not exceed 20% of the stream reach. No concentrated livestock use would occur within	With no stress from livestock grazing, it is likely that stream and riparian areas would move toward desired condition.

Indicator	Alternative 1: Proposed Action	Alternative 2: No Action
	0.25 miles of a stream or other waterbody. Under these grazing conditions the riparian vegetation can maintain health and function to maintain stream channel integrity and water quality. If the site is functioning-at-risk, light to moderate grazing (less than 35 percent) should allow the site to begin to decrease the amount of bare ground, and the site's vulnerability to the establishment of noxious weeds or other undesirable plants should be reduced. Spring water collection developments would sustain overflow and would also be shut off when not in use.	
Soil quality	Implementation of the utilization standards would maintain a healthy vegetative cover and protect the soil resources. The percent bare ground and compaction may increase in areas of concentrated use, such as bedding areas and water developments.	With no stress from livestock grazing, it is likely that impacts to soil (compaction and vegetation removal) would decrease. Areas would move toward desired condition.
Water Quality	Implementation of proper use criteria and project design criteria would result in maintenance of riparian vegetation and limited streambank disturbance. Under herding, sheep congregation in riparian areas will be minimized. Whereas concentration of nutrients and/or fecal coliform in water may become temporarily elevated at specific times, the Proposed Action would protect water quality to meet state standards.	There would no longer be any livestock urine and fecal material to contribute bacteria to streams.
Areas with Concentrated Use	The concentrated use areas in these allotments would be the bedding sites and around the livestock water developments. Bedding areas would be identified prior to the grazing season and would be located on the hillslope away from streams and other waterbodies. Water developments will be places in upland, xeric plant communities and will not be near meadows, seeps, or riparian areas. There is the potential for increased compaction and bare soil in these sites.	Use of concentrated areas would no longer be needed. Conditions in formerly used areas would improve.

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Riparian Conditions

Alternative 1: Proposed Action: Livestock management can affect riparian condition by trampling, utilization of vegetation for forage and infrastructure development in these areas. As discussed in the Specialist Report and summarized in Table 20, because the Proposed Action implements the standards for allowable utilization in riparian areas, riparian conditions are expected to maintain health and function to maintain channel integrity and water quality. Water developments including water collection at springs will be designed with an overflow feature so as to not take all water flow into the pipes, or to allow for shut off of the diversion. These design features would sustain flow to downstream riparian vegetation.

Alternative 2: No Action/No Grazing: Under the No Action alternative, trampling and grazing would be removed from riparian areas. With no stress from livestock grazing, it is likely that stream and riparian areas would move toward desired condition, which would aid in their recovery compared to the Proposed Action.

Soil Quality

Alternative 1: Proposed Action: The grazing of domestic livestock may affect the productivity of soils primarily through the reduction of vegetative cover (defoliation) and trampling of the soil surface. Trampling of the soil surface by grazing animals may affect soil properties by reducing vegetative and litter cover, churning or tilling the soil by hoof action, and compacting the surface and sub-surface of the soil. Through herbivory, digestion, and excretion, grazing animals may increase the decomposition rate and alter the amounts of nutrients stored in the soil, the spatial distribution of those nutrients, and the availability of those nutrients to plants. As discussed in the

Specialist Report and summarized in Table 20, because the Proposed Action implements the standards for allowable utilization, healthy vegetation cover is anticipated to be sustained. Soil quality and percent bare ground may be impacted in concentrated areas although monitoring and sheep herding will minimize these longer-term impacts.

Alternative 2: No Action/No Grazing: Under the No Action Alternative, it is likely that impacts to soil (compaction and vegetation removal) would decrease. Areas would move toward desired condition.

Water Quality

Alternative 1: Proposed Action: Livestock grazing has the potential to affect water quality. Bacteria and nitrogen can increase as a result of livestock fecal matter. Water temperature may increase as an indirect effect of reduced riparian vegetation and/or streambank trampling, which increases stream channel width. Under herding, sheep congregation in riparian areas will be minimized under the Proposed Action. Whereas concentration of nutrients and/or fecal coliform in water may become temporarily elevated at specific times, the Proposed Action would protect water quality to meet state standards.

Alternative 2: No Action/No Grazing: Under the No Action Alternative, there would no longer be any livestock urine and fecal material to contribute bacteria to streams.

Concentrated Use

Alternative 1: Proposed Action: Livestock tend to concentrate in areas such as water developments and fence lines. These areas are more likely to have soil quality problems such as compaction and bare grounds. As summarized in Table 20, under the Proposed Action, the concentrated use areas in these allotments would be the bedding sites and around the livestock water developments. Bedding areas would be identified prior to the grazing season and would be located on the hillslope away from streams and other waterbodies. There is the potential for increased compaction and bare soil in these sites. Impacts to soil quality are unavoidable in these areas; however, the total acres affected constitute a very small portion of the project area. In addition, new water developments will be placed in upland, xeric areas thereby minimizing compaction to soils.

Alternative 2: No Action/No Grazing: Under the No Action Alternative, use of concentrated areas would no longer be needed. Conditions in formerly used areas would improve.

Cumulative Effects

The Watershed Resources specialist report evaluated the potential of cumulative effects associated with the Proposed Action resulting from the Washington Fire, the Monitor Pass Aspen Enhancement, and ongoing OHV and dispersed recreation. It found that the road improvement actions associated with the post-fire rehabilitation cumulatively reduced erosion along the Loope Canyon Road. The rest period allowed for recovery of hillslope vegetation in the burned areas to reduce the amount of bare soil and the potential for erosion. The Report found that the potential for cumulative effects to the Poison and Mountaineer Creeks from implementation of the Monitor Pass Aspen Enhancement project in is small. Potential impacts would be reduced with the implementation of project design features and would be short term as aspen re-establishes.
Sheep grazing would be excluded from aspen treatment areas until aspen reaches an acceptable height.

Although motor vehicle use off designated routes is prohibited throughout the entire project area, the Loope Canyon road and other roads in the Campbell-Loope Allotment are popular OHV use areas. The Monitor Pass area is also popular for dispersed recreation. Roads in riparian areas and road/stream crossings can increase erosion and degrade streambank stability. Impacts to vegetation and soils have been observed particularly along roads near the river including increased erosion, soil compaction and loss of riparian vegetation. Recreation activities such as motorized dispersed camping can impact vulnerable plant communities such as meadows and riparian areas due to compaction and trampling of vegetation. Dispersed camping tends to be confine to a few areas. Although the direct

and indirect effect from sheep grazing to soil and water quality in the in these allotments is likely to be small, there is the potential for cumulative effects under the proposed action when combined with impacts from OHV use and dispersed recreation.
The Report found that under Alternative 2 (No Action) there will be no direct or indirect effects to recreation or to roadless characteristics or to recreation. This alternative would not contribute to trends in roadless characteristics or contribute to effects of other projects or activities in the area.

Conclusion: Direct, indirect and cumulative effects of each alternative are analyzed in the Watershed Resources Specialist Report. Based on existing information, the best available science, comments received from other agencies and the public, and the information provided by the Forest Service hydrologist, and the ID Team, it was determined that design features and project monitoring are adequate to minimize effects to water and soil resources and result in Forest Plan consistency under each of the alternatives, including the proposed action.

3.2.6. **Recreation and Inventoried Roadless Areas**

The Recreation and Inventoried Roadless Areas specialist report evaluated the potential impacts of the Proposed Action and No Action Alternative on watershed, water quality, and soil resources. The indicators displayed in Table 21 and in the descriptive text below were used in the analysis to evaluate change from the existing condition for each of the alternatives.

Table 21: Summary of Effects to Recreation and Inventoried Roadless Areas from the Proposed Action and the No Action Alternatives.

Indicator	Alternative 1: Proposed Action	Alternative 2: No Action
Recreation: Evidence of domestic livestock activity on roads or in dispersed camping areas used for recreation.	Minimal effect. Forest Service lands provide for primitive and semi-primitive recreation opportunities. The primary effects from sheep grazing are the sights, sounds and evidence of sheep. Grazing and trailing along roads and near camping areas would occur rarely. Grazing activities are managed by a herder who would move sheep away from areas. Project Design Elements, including avoiding stream crossings and maintenance activities during weekends and holidays when feasible, will further decrease the effects of livestock activity on recreational users.	No effect. There may be some evidence of historic grazing but any effects to recreation will generally lessen over time under the No Action/No Grazing alternative.
Roadless Characteristics of Mt Bullion Roadless Area: Evaluation of potential for grazing activities to alter or contribute to trends in roadless characteristics.	Table 4 of the Recreation and Roadless Area Specialist Report details findings regarding effects to roadless characteristics. According to the report, the Proposed Action will have minor effects to primitive forms of recreation and scenic integrity from the sights and sounds livestock grazing, and reconstruction of the Poor Boy water development (which is located within its original footprint and on an existing system road). Periodic trailing of sheep would have localized, short-duration impacts.	The No Action/No Grazing alternative will not contribute to negative trends in roadless characteristics in the Mt. Bullion roadless area. Evidence of past grazing would decrease over time.

Recreation effects from domestic livestock activity on roads or in dispersed camping areas

Alternative 1: Proposed Action: Design Features of the Proposed Action including the following will minimize effects to recreation. When feasible, sheep crossing on the East Fork Carson River would be limited to weekdays, as well as federal and state holidays when recreation use is typically greater. Under the Proposed Action, the adjustment to the allotment boundary on Campbell-Loope will exclude wilderness areas and the Pacific Crest Trail. Because sheep have not grazed in this area for several decades due to the lack of accessibility and forage, this

action will likely have minimal effects on recreation. Overall, the described effects will generally be minimal and can be effectively minimized with proper management as described in the proposed action.

Alternative 2: No Action/No Grazing: Under the No Action alternative there would be no livestock activity in the project area and effects from sheep grazing (sights, smells, sounds etc.) would no longer occur. Evidence of past grazing would decrease over time.

Roadless Characteristics of Mt Bullion Roadless Area. Evaluation of potential for grazing activities to alter or contribute to trends in roadless characteristics

Alternative 1: Proposed Action: Under the Proposed Action, sheep would graze and trail within the Mt. Bullion Roadless Area. No new roads would be constructed. One new water development would occur along the roadless area boundary and Poor Boy Road. When feasible maintenance activities on the Poor Boy spring/troughs would be limited to weekdays, as well as avoid federal and state holidays to reduce impacts to roadless area characteristics.

Alternative 2: No Action/No Grazing: Under the No Action alternative, there would be no livestock activity in the project area and therefore no effects to roadless characteristics from sheep grazing (sights, smells, sounds etc.) would occur. Evidence of past grazing would decrease over time.

Cumulative Effects

The Recreation and Roadless Area Specialist Report evaluated impacts from the Monitor Pass Habitat Restoration Project, the recent wildfires, California Integrated Weeds Management Project, and OHV and dispersed recreation to evaluate potential cumulative effects associated with the Range Project Proposed Action. It found that while the listed activities may affect recreation in various ways it is unlikely that any affect the measurement indicator for this project, evidence of domestic livestock activity on roads or in dispersed camping areas used for recreation. Other activities, like illegal motor vehicle use and firewood cutting, can leave evidence that is visible from camping areas and trails, that when added to the evidence of livestock grazing could have a greater affect to recreation than this project alone. The Report found that listed activities are not expected to contribute to cumulative impacts to roadless characteristics. These projects, and the proposed grazing project, have built in design features to minimize impacts to roadless characteristics. OHV and dispersed recreation use, coupled with grazing, could have a cumulative impact to primitive/semi-primitive roadless area characteristics, however design features have been included in this report to minimize those effects. Additionally, most grazing activities will occur away from areas where recreation occurs and large areas of adjacent Forest Service lands provide for similarly primitive recreation opportunities.

The Report found that under Alternative 2 (No Action) there will be no direct or indirect effects to recreation or to roadless characteristics or to recreation. This alternative would not contribute to trends in roadless characteristics or contribute to effects of other projects or activities in the area.

Both alternatives are consistent with the Toiyabe National Forest Land and Resource Management Plan as it pertains to recreation, roadless areas, and range developments. Neither of the alternatives would pose an irretrievable or irreversible commitment of resources pertaining to recreation or roadless characteristics.

3.2.7. **Wilderness**

A portion of the Campbell-Loope Allotment is located within the Mokelumne Wilderness and was an established allotment prior to wilderness designation in 1984. Consistent with provisions in the Wilderness Act and the Congressional Grazing Guidelines (USDA FS 2007a, FSM 2323.23), the allotment was preserved and has been inactive or vacant status since.

Alternative 1: Proposed Action: The Proposed Action would redefine the Campbell-Loope allotment boundary to exclude areas that are largely inaccessible to livestock and contain only small, non-contiguous patches of forage (EA Table 5). The realignment of the boundary would also exclude Mokelumne Wilderness areas from the allotment. While this action theoretically would minimize effects to the Wilderness characteristics in these areas, sheep grazing has not occurred in this portion of the wilderness or Pacific Crest Trail in several decades due to inaccessibility and lack of forage. The removal of wilderness from the permitted area is based on the limited number of capable acres as well as poor access to the area. In general, however, livestock grazing is an acceptable use in wilderness areas and is consistent with provisions in the Wilderness Act and the Congressional Grazing Guidelines (USDA FS 2007a, FSM 2323.23).

Alternative 2: No Action/No Grazing: Under the No Action alternative the effects would be equivalent to the action alternative due to the historic lack of sheep grazing activity in these areas, although the boundary of the allotment would not be changed.

Draft Finding of No Significant Impact (FONSI)

The responsible official is responsible for evaluating the effects of the project relative to the definition of significance established by the Council for Environmental Quality (CEQ) Regulations (40 CFR 1508.13). Based on review and consideration of the Environmental Assessment (EA) and documentation included in the project record, they have determined that the Proposed Action for the Leviathan-Loope Rangeland Project would not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. Rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance.

Context

Disclosure of direct, indirect, and cumulative effects in the EA demonstrate analysis of the proposed action primarily in the context of the analysis area (i.e., effects within the Leviathan-Loope Rangeland Project analysis area) and the locality (e.g., effects beyond the boundaries of the project area, including downstream and to adjacent landowners). Effects to the geographic region were also considered. Both short-term and long-term effects of the Proposed Action were found to be of limited extent and are not expected to affect national resources or the human environment (EA Chapter 3 Environmental Effects pages 34-64).

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effect's analysis of the EA, specialist reports, and the references in the project record. The effects of this project have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. The finding of no significant effect is based on the context of the project and intensity of effects using the 10 factors identified in 40 CFR 1508.27(b). Effects that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

The interdisciplinary team analyzed the direct, indirect, and cumulative effects of the Proposed Action on resources in and around the Leviathan-Loope Project analysis area. The analyses documented in the Environmental Effects Chapter 3 of the EA (pages 34-–64) state that some direct, indirect, and cumulative effects are expected in the short-term in the context of the analysis area. Design features have been agreed upon by the ID Team to ensure that even short-term effects to these resources will not be significant. The project record also includes detailed analyses of the effects of the alternatives to range, vegetation, soil, hydrology, recreation and designated areas, wildlife, fisheries and aquatics, botanical resources, and cultural resources. These analyses contribute to the decision maker's

understanding of the effects of the alternatives and confirm that there will be no significant effects to those resources.

1. Effects that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

The interdisciplinary team analyzed the direct, indirect, and cumulative effects of the proposed action on biological, physical, and cultural resources in and around the Leviathan-Loope Project analysis area. The analyses documented in the Environmental Effects chapter of the EA (pages 34-64) state that some direct, indirect, and cumulative effects are expected in the short-term in the context of the analysis area. Design features have been agreed upon by the ID Team to ensure that even short-term effects to these resources will not be significant. The project record also includes detailed analyses of the effects of the alternatives to range, vegetation, soil, hydrology, recreation and designated areas, wildlife, fisheries and aquatics, botanical resources, and cultural resources. These analyses contribute to the decision maker's understanding of the effects of the alternatives and confirm that there will be no significant effects to those resources.

2. The degree to which the project affects public health or safety.

The proposed action is not expected to significantly affect public health or safety. The use of a herder with herding dogs on site at all times minimizes the potential for livestock to negatively interact with humans. Under the No Action Alternative, permitted grazing would cease and the presence of livestock and range management would be terminated.

3. Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

Campbell-Loope Allotment is located within the Mokelumne Wilderness and was an established allotment prior to wilderness designation in 1964/84. Consistent with provisions in the Wilderness Act and the Congressional Grazing Guidelines (USDA FS 2007a, FSM 2323.23), the allotment was preserved and has been in active or vacant status since. However, the portion of the allotment in wilderness has low forage capability and is largely inaccessible to livestock and therefore has not been used by the permittee for livestock grazing. As part of the Decision, the boundary of the Campbell-Loope Allotment will be adjusted to exclude this portion of the allotment to more accurately reflect the grazing use. EA pp. 30 and 64 and Appendix A: Response to Comment # 38.

The EA (pages 62-64) and the Recreation and Roadless Area Specialist Report summarizes potential impacts to Mt. Bullion Roadless Area which is located in the project area. The activities and impacts are consistent with the Toiyabe National Forest Land and Resource Management Plan as it pertains to recreation, roadless areas, and range developments.

The analysis area does not include parklands, prime farmlands, wild and scenic rivers, or ecologically critical areas. A survey of cultural resources has been completed in accordance with consultation with the California and Nevada State Historic Preservation Offices and Section 106 of the National Historic Preservation Act to ensure that any cultural resources found within proposed treatment areas will be protected (EA pages 33, 49).

The special and unique legal and political relationships of tribal governments and the United States government are reflected in the United States Constitution, treaties, statutes, court decisions, executive orders, and memoranda. These relationships impart a duty on all federal actions to consult, coordinate, and communicate with American Indian Tribes on a government-to-government basis. Because American Indian Tribes can be affected by Forest Service policies and actions managing the lands and resources under its jurisdiction, the Forest Service has a duty to consult with American Indian Tribes on matters affecting their interests. Because of this government-to-government relationship, efforts were made to involve local tribal governments and to solicit their input regarding the proposed

action. Communication and consultation with tribal governments has occurred since 2013. In conclusion, analysis found that the Project would interface with designated areas but would not pose to significant changes or effects to these areas.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The key concerns raised during public comment periods were related to allotment boundary adjustments within the wilderness, proposed allotment closures, climate change and potential impacts to bi-state sage grouse. While there will continue to be disagreement regarding multiple uses of National Forest System lands, these issues are addressed in the EA (pages 12-13; Appendix A Comments 17-24, 35, 38, 39-42) and in various sections of the Range, Vegetation, and Wildlife Specialist Reports and are not considered to be highly controversial.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The effects analyses documented in the EA and in the project record incorporated accepted techniques and methods, the best available scientific literature, reliable data, field review, and the judgment of qualified professional resource specialists. Neither these analyses nor public comments identified highly uncertain effects or unique or unknown risks associated with the alternatives (EA pages 34-64).

6. The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.

Comments expressed concern that the Leviathan-Loope Rangeland Project Proposed Action could be detrimental to the future of grazing in the area due to the modification of the Campbell-Loope Allotment boundary, which would exclude a portion of the Mokelumne Wilderness. The Proposed Action would also close three grazing allotments (Mud Lake, Double Springs, and Barber). In the EA, it was determined these actions would have no measurable effect on grazing due to the current lack of forage capability, access, and general grazing feasibility of these areas. Additionally, Mud Lake, Double Springs, Barber and the wilderness portion of the Campbell-Loope Allotment have not been grazed for several decades while in Forest Service management. Concerns regarding boundary adjustments and allotment closures were addressed in more detail in the EA on pages 12, 30, 32, 46, as well as in Appendix A; Comment #35 and #38, and in the Range Specialist Report. Under the No Action Alternative, livestock would be removed from the allotments and the Campbell-Loope Allotment boundary would not be changed. Allotments would remain vacant and continue to have no effect on range management.

The activities associated with the Leviathan-Loope Rangeland Project analysis area are similar to many that have previously been implemented and will continue to be implemented by Forest Service line officers on National Forest System lands. The activities are within the scope of the Forest Plan and are not expected to establish a precedent for future actions.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant effects. Significance exists if it is reasonable to anticipate a cumulatively significant effect on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

The analysis completed for the EA demonstrates that there are no significant cumulative effects on the environment when project impacts are combined with the effects of past and reasonably foreseeable future projects and the

effects from natural changes taking place in the environment (EA pages 34-64 and individual resource specialist reports).

8. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

The Cultural Resource Report for the Leviathan-Loope Range Rescission Project (R2014041702413) addresses the potential effects to cultural resources from the authorization of livestock grazing and from the No Action Alternative. Cultural resources in the project area are being managed in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA). The Forest Service consulted with the California State Historic Preservation Office (SHPO) on the identification efforts, eligibility determinations and effects determinations. It received concurrence in a letter dated April 17, 2019. Design features identified in the Environmental Assessment shall be followed to ensure no adverse effects to cultural resources.

9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

A Biological Assessment (BA) was prepared to analyze the effects to Lahontan cutthroat trout (LCT) which is the only federally listed species that occurs in the project area. LCT occur within the project area within the East Carson River which is in the Western Lahontan Basin Geographic Management Unit (GMU) for LCT. However, this portion of the East Carson River contains LCT that are stocked for recreational fisheries and does not contain any recovery populations. The EA (pp. 52-53) summarizes the BA prepared for LCT. In a letter received on July 16, 2019, the USFWS concurred with the Forest Service determination that the proposed project may affect but will not adversely affect LCT (USDI 2019 and Biological Assessment-Project File). The Biological Evaluation found no impact from the No Action alternative.

A Biological Evaluation (BE) was prepared to analyze the potential impacts of the Alternatives to Region 4 Forest Sensitive Wildlife Species and is summarized in the EA (Table 18, pp. 49-56). According to the BE, activities associated with the Proposed Action may impact individual bi-state sage grouse as well as mountain quail but will not result in a loss of viability or lead to a trend toward federal listing. The greater sage grouse bi-state Distinct Population Segment (DPS) population is proposed for listing as threatened by the U.S. Fish and Wildlife Service (USFWS) in October 2013. A rule to delineate proposed critical habitat was also issued at this time. The greater sage grouse bi-state DPS is also designated as a Region 4 Forest Service sensitive species. Potential impacts to bi-state sage grouse and mountain quail were considered to be minor and offset by the expected improved conditions to sage grouse and mountain quail habitat from implementation of the Proposed Action. In addition, the project will not adversely affect proposed critical habitat for Bi-state sage grouse. The BE found no impact to any Region 4 Forest Sensitive species from the No Action alternative.

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The Alternatives are consistent with Federal, State, and local laws and requirements required for the protection of the environment. These include the following:

Migratory Bird Treaty Act: The Wildlife Specialist Report analyzed potential impacts from the Alternatives to migratory birds, consistent with the act, the subsequent Executive Order 13186, and the memorandum of understanding between the USDI Fish and Wildlife Service and USDA Forest Service, which provides for the protection of migratory birds (Wildlife Specialist Report; summarized in EA pp 57-59). It found that the Proposed

Action may result in short-term impacts but will not lead to any long-term effects to migratory bird populations, alter their distribution, or affect their conservation status. It found that under the No Action Alternative, there would be no direct, indirect or cumulative effects to migratory birds.

National Clean Water Act, as amended; Water Rights: The Watershed Resources report (summarized in the EA (pp. 59-62) evaluated consistency with the Clean Water Act (as primarily administered through Regional Water Quality Control Boards) and through the California water rights database. Based on the information of the EA and the project record concerning hydrology, the Alternatives are consistent with the Clean Water Act (as amended).

National Historic Preservation Act (NHPA) and 36 CFR Part 800-The Section 106 Process: General consistency with the NHPA was documented in FONSI element 8 above. Consistent with 36 CFR Part 800, communications were established with Tribal Representatives to assure government-to-government communication prior to initiating scoping of the project. The Bridgeport Indian Colony was not originally involved in these communications but will be included in any future discussions about activities in the Monitor Pass area, including the Leviathan-Loope Rangeland Project. Because of this government-to-government relationship, efforts were made to involve local tribal governments and to solicit their input regarding the proposed action. Formal consultation was initiated with the Washoe Tribe of Nevada and California at a semi-annual meeting in 2013. As a result of the meeting, concern for an important cultural site was expressed and a site visit requested. Former District Archaeologist, Joe Garrotto, and the Tribal Historic Preservation Officer (THPO) for the Washoe Tribe visited the location in summer 2013. As part of this undertaking, the site was fully recorded with the help of the Washoe THPO and other volunteers. In addition to being formally recorded, sheep will not be allowed to graze within the site boundaries. The project was also discussed in subsequent formal consultation meetings in March 2015 and March 2016. The Tribe expressed no other concerns regarding this project.

Executive Order 119990 of May 1977 (Wetlands): This executive order requires the Forest Service to take action to minimize destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In compliance with this order, Forest Service direction requires that an analysis be completed to determine whether adverse impacts would result. The EA and the project record confirm that this decision complies with EO 11990 by maintaining and restoring riparian conditions.

Executive Order 11988 of May 1977 (Floodplains): This executive order requires the Forest Service to provide leadership and to take action to (1) minimize adverse impacts associated with occupancy and modification of floodplains and reduce risks of flood loss; (2) minimize impacts of floods on human safety, health, and welfare; and (3) restore and preserve the natural and beneficial values served by flood plains. The EA and the project record confirm that this decision complies with EO 11998 by maintaining floodplain integrity.

Other National Forest Management Act (NFMA) Requirements – The Action Alternative is consistent with the following provisions of the NNFMA:

a. Soil, slope, or other watershed conditions will not be irreversibly damaged (16 USC 1604(g)(3)(E)(i)).

b. Protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat (16 USC 1604(g)(3)(E)(iii)).

Management Indicator Species: USDA Forest Service Management Indicator Species (MIS). MIS are identified in the Toiyabe National Forest Land and Resource Management Plan (USDA 1986) as representing a group of species having similar habitat requirements. A review was conducted to determine: 1) if the project is within the range of any MIS, 2) if habitat is present within the proposed project area, and 3) if there are potential direct, indirect or cumulative effects on habitat components. The EA pp. 57-59 summarizes the findings of the MIS analysis from the Wildlife Specialist Report.

Humboldt-Toiyabe FSM Supplement to Chapter 2080 – Noxious Weeds Management: Leviathan-Loope Rangeland Project Vegetation Specialist Report and Noxious Weed Risk Assessment, which is summarized in the EA 36-45 and Table 14, evaluated the potential for both alternatives to introduce and/or expand noxious weeds and other invasive species into the Leviathan-Loope Rangeland Project area. The Weed Risk Assessment was conducted consistent with Forest Service Manual 2081.02 and the Sierra Nevada Forest Plan Amendment (SNFPA), and developed design features associated with the alternatives would reduce the risk of weed establishment and/or spread. Design Features were established to comply with Noxious Weed Order 36 CFR 261.58(t)/regional order 04-00-097.

Agencies, Organizations, and Persons Consulted

The Forest Service consulted the following individuals, Federal, State, Tribal, and local agencies during the development of this environmental assessment:

- Alpine Co. Board of Supervisors
- Alpine Co. Chamber of Commerce
- Alpine Watershed Group
- Dick Artley
- Back Country Horsemen
- Bureau of Indian Affairs
- BLM- Carson City District office
- Stanislaus National Forest Calaveras Ranger District
- CA Department of Fish & Wildlife
- CA Wilderness Coalition
- Carson Water Subconservancy District
- Center for Biological Diversity
- El Dorado National Forest, Amador Ranger District
- Roy F. & Dorothy H. Heise Trust
- F.I.M. Corporation
- FLP, DBA Borda Land & Sheep Co.
- Friends of Hope Valley
- Forest Service Employees for Environmental Ethics
- Lahontan Regional Water Quality Control Board
- Nevada Department of Agriculture
- Pacific Crest Trail Association
- Park Livestock Company
- Lahontan Regional Water Quality Control Board
- Sierra Club -Toiyabe Chapter
- State Water Resources Control Board Leviathan Mine Project
- High Sierra Hikers Association
- Truckee Meadows Weed Coordinating Group
- US Fish and Wildlife Service
- Washoe Tribe of Nevada & California
- Western Watersheds Project
- Wooster
- Russel Scossa
- Mono County Board of Supervisors